FOOD AND AGRICULTURE COMPETITIVELY AWARDED RESEARCH AND EDUCATION GRANTS

Fiscal Year 1985

UNITED STATES
DEPARTMENT OF
AGRICULTURE

PREPARED BY:
OFFICE OF GRANTS
AND PROGRAM SYSTEMS
SCIENCE AND EDUCATION

DECEMBER 1985

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FOREWORD

Our country has an excellent State-Federal agricultural and forestry research partnership that has helped develop an agricultural research system that is envied the world over. The ability of our agriculture to produce efficiently and meet each new need is the result of the support of this strong, stable research system. It provides the continuing research base with the resources and continuity necessary for scientific advances on the many fronts involved in modern-day agriculture.

The grants reported in this publication represent still another aspect of this research system--the Competitive, Special, Forest and Rangeland Renewable Resources, Rangeland, and Small Business Innovation Research grants programs as well as the Food and Agricultural Sciences National Needs Graduate Fellowships grant program. Collectively, the focus is primarily on basic research or education to discover the information needed before we can make further important and necessary breakthroughs in our applied research programs.

Qualified scientists both inside and outside the traditional agricultural research system apply for and receive these grants. Thus, not only scientists from the Federal laboratories, the State agricultural experiment station, the schools of forestry, the 1890 universities and Tuskegee University, and the colleges of veterinary medicine, but qualified scientists from various other organizations, both public and private, participate in the programs.

The primary aim of the mission-oriented basic research program is discovering new information needed to further significant progress in the plant sciences--photosynthesis, biological nitrogen fixation, genetic mechanisms, biological stress, biotechnology, and in human nutrition. Other areas supported by grant programs include animal health, aquaculture, soybean, and alcohol fuels research as well as food and agricultural sciences areas suitable for graduate work and small business participation.

During the Fiscal Year October 1, 1984, through September 30, 1985, 739 competitive grants totaling $66,442,883 were awarded.

It is our belief that out of this combination of a sound, stable ongoing research system, with a viable extramural grants program to attack significant and difficult problems in agricultural science, comes the information and knowledge necessary to keep our U.S. agriculture strong and resilient--ready and able to meet any challenge that might be ahead.

Wm D Carlson

WILLIAM D. CARLSON
Acting Associate Administrator
Office of Grants and Program Systems

John Patrick Jordan

JOHN PATRICK JORDAN
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Office of Grants and Program Systems

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FOOD AND AGRICULTURE COMPETITIVELY AWARDED RESEARACH AND EDUCATION GRANTS

Fiscal Year 1985

THE GRANTS PROGRAMS

The research grants programs of science and education under which the competitive selection process was used during Fiscal Year 1985 were:

1. Competitive Research Grants Program to support basic research in the food and agricultural sciences;

2. Special Research Grants Program to support research deemed by Congress and the Department of Agriculture to be of particular importance to the Nation;

3. Forest and Rangeland Renewable Resources Program to support basic research in the areas of harvesting, wood utilization and forest biology.

These sources of funding supplement and complement funding of Federal agricultural research and the basic State research institution formula funding by Congress to help maintain a viable, effective, ongoing State-Federal agricultural research capability for this country.

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In addition, grants were awarded competitively for the following programs:

4. Rangeland Research Grants Program to support basic research in certain areas of rangeland research.

5. Small Business Innovation Research Program, a primary aim of which is to stimulate technological innovation in the private sector.

Renewals were also awarded for second year support of fellows selected competitively last year under the Food and Agricultural Sciences National Needs Graduate Fellowships Grants Program which is helping develop professional and scientific expertise in the food and agricultural sciences.

Grant funds for all of the above programs are administered through the Office of Grants and Program Systems.

Guidelines for grants to be awarded competitively are published annually in the *Federal Register*, usually near the end of each calendar year. The guidelines identify selected research areas, the amount of funding, and requirements for the submission of proposals.

Single copies or annual or semiannual subscriptions for the Federal Register are available for a small charge from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

If you want further information on programmatic aspects of these grants, contact:

Dr. William D. Carlson
Acting Associate Administrator
Office of Grants and Program Systems
U.S. Department of Agriculture
14th and Independence Avenue, S.W.
Washington, D.C. 20250

If you want information on administrative aspects of these grants, contact:

Mr. Terry J. Pacovsky
Chief
Grants Administrative Management
Office of Grants and Program Systems
U.S. Department of Agriculture
15th and Independence Avenue, S.W.
Washington, D.C. 20251

The following are listings of awards by Program areas for Fiscal Year 1985. Please note that some of these awards are renewals/amendments to existing projects and are identifiable by agreement periods starting prior to 10/1/84.

COMPETITIVE RESEARCH GRANTS PROGRAM

The following tabulation lists the funds awarded in the various areas in Fiscal Year 1985 under the Competitive Research Grants Program.

Plant Biology		$14,161,544
Biological Nitrogen Fixation	$3,060,000	
Biological Stress on Plants	4,181,544	
Genetic Mechanisms for Crop Improvement	3,860,000	
Photosynthesis	3,060,000	
Human Requirements for Nutrients		$ 1,920,600
Biotechnology		$19,206,000
Animal Molecular Biology	4,381,000	
Plant Molecular Biology	4,100,000	
Animal Growth and Development	3,400,000	
Plant Growth and Development	2,225,000	
Response to Environmental Stress	2,000,000	
Response to Biological Stress	3,100,000	
Animal Science		$4,321,350
Insect Pest Science		$2,880,900
Acid Precipitation		$ 667,409
Alcohol Fuels Research		$ 518,562
Soybean Research		$ 497,435
	TOTAL	$44,173,800

This program is administered under the authority of Section 2(b) of P.L. 89-106, 7 U.S.C. 450i(b), as amended by Section 1414(b) of P.L. 95-113 and Section 1415(a) of P.L. 97-98, and in accordance with Sections 6301-6308 of P.L. 97-258. Section 1419 of P.L. 95-113, as amended, authorized grants for the Alcohol Fuels Research Program.

U.S. colleges and universities, other research institutions, Federal agencies, private organizations or corporations, and individuals may submit proposals.

PLANT BIOLOGY

Grants were awarded in four areas of research in plant biology: Biological nitrogen fixation, biological stress on plants, genetic mechanisms for crop improvement, and photosynthesis. A brief description of each area of research follow with a listing of research grants made during Fiscal Year 1985.

Biological Nitrogen Fixation

Grants in this area support research to find ways to naturally increase the nitrogen available to plants. Lack of nitrogen for plant growth is the most common limiting factor in crop agriculture. This research will contribute to understanding nitrogen-fixing mechanisms in both symbiotic and free-living organisms, as well as the fate of fixed nitrogen.

The objective of this research is to build a foundation of basic information concerning nitrogen fixation. This information should help us enhance the process in currently known systems and provide a base for developing new nitrogen-fixing associations--by genetic transfer or other means--for crop species not now posing such capability.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT FROM	PERIOD TO	TITLE
Univ. of California Berkeley, CA 94720	John B. Neilands	$50,000	09/01/85	08/31/86	Iron Assimilation in Symbiotic Nitrogen Fixing Microoganisms
Univ. of California Davis, CA 95616	Donald A. Phillips	$100,000	09/01/83	08/31/87	Host Legume Effects on Hydrogen Evolution by Rhizobium
Univ. of California Davis, CA 95616	John C. Meeks	$95,000	08/01/83	07/31/87	Regulation of Growth and Heterocyst Differentiation in Symbiotic Cyanobacteria
Univ. of California Davis, CA 95616	John L. Ingraham	$60,000	07/01/84	06/30/86	Physiological Denitrification: A Route to Conserving Fixed Nitrogen
Univ. of California Irvine, CA 92717	Barbara K. Burgess	$70,000	08/01/85	07/31/86	Substrate Reactions in Nitrogenase
Univ. of Southern California Los Angeles, CA 90089	Robert Bau	$70,000	07/01/85	06/30/87	Crystallographic Studies on the Iron-Molybdenum Co-Factor of Nitrogenase

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of California Santa Cruz, CA 95064	Robert Ludwig	$80,000	07/01/85	06/30/87	Mechanisms of Rhizobium ORS 571 N_2 Fixation
Univ. of Connecticut Storrs, CT 06268	David R. Benson	$85,000	07/01/85	06/30/87	Symbiotic Interactions in the Frankia Symbiosis
Univ. of Hawaii at Manoa Honolulu, HI 96822	B. Ben Bohlool	$80,000	07/01/85	06/30/87	Host Control of Nodule Formation and Development in Soybean/Rhizobium N_2 Fixing Symbiosis
Univ. of Chicago Chicago, IL 60637	Robert Haselkorn	$70,000	07/01/85	06/30/86	Rearrangement of Nitrogen Fixation Genes in Cyanobacterial Heterocyst Differentiation
Univ of Chicago Chicago, IL 60637	Robert Haselkorn	$70,000	08/01/84	07/31/86	Nitrogen Fixation in Blue-green Algae (Cyanobacteria)
Agricultural Research Service, USDA 1815 N. University Street Peoria, IL 61604	James E. Harper	$33,000	09/01/85	08/31/87	Interaction of Nitrate Metabolism with Nodulation of Soybean

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Purdue Res. Fdn. West Lafayette, IN 47907	J. T. Bolin	$105,000	08/01/83	07/31/87	Three-dimensional Structure of Nitrogenase
Univ of Massachusetts Amherst, MA 01003	Steven J. Robinson	$80,000	07/01/85	06/30/87	Transcription of a Second Copy of the Gene for Nitrogenase Reductase in *Anabaena*
Northeastern Univ. Boston, MA 02115	Kostia Bergman	$65,000	08/01/83	07/31/86	Motility and Chemotaxis in *Rhizobium meliloti*
Massachusetts Inst. of Technology Cambridge, MA 02139	W. Orme-Johnson	$75,000	06/15/84	06/30/86	Biochemical and Genetic Approaches to Structure and Function of MoFe Cofactor
Harvard College Cambridge, MA 02138	John G. Torrey	$89,734	08/01/83	07/31/87	Sporulation by *Frankia* Related to Nodulation and N2 Fixation

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Michigan State Univ. East Lansing, MI 48824	Barry K. Chelm	$55,000	08/15/85	03/31/86	Developmental and Physiological Gene Regulation in the Rhizobium/Legume Symbiosis
Michigan State Univ. East Lansing, MI 48824	John L. Wang	$43,000	09/01/83	08/31/86	Lectin Receptors and Cytoskeletal Proteins in Soybean Cells
Michigan State Univ. East Lansing, MI 48824	Frank B. Dazzo	$125,000	07/01/85	06/30/87	Clover Root Hair Responses to Rhizobium trifolii and its Biologically Active Polysaccharides
Michigan Tech. Univ. Houghton, MI 49931	Wilbur H. Campbell	$45,000	08/01/85	07/31/86	Regulation of Corn Nitrate Reductase: Application of Monoclonal Antibodies
Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 54401	Carroll P. Vance	$90,000	08/01/83	06/30/87	Regulation of Plant-Bacterial Interactions During Legume Root Nodule Formation
Univ. of Minnesota St. Paul, MN 55104	Edmund P. Day	$85,000	08/01/83	07/31/87	Magnetic Susceptibility Studies of Nitrogenase

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Missouri Columbia, MO 65211	David W. Emerich	$110,000	09/01/85	08/31/87	Symbiotic Nitrogen Fixation: The Role of Organic Acids
Univ. of Missouri Columbia, MO 65211	Dale G. Blevins	$130,000	08/01/85	07/31/87	Ureide Metabolism in Nodulated Soybeans
Univ. of Missouri Columbia, MO 65211	Judy D. Wall	$45,000	09/15/84	09/30/86	Nitrogen Metabolism and Nitrogen Fixation of *Rhodopseudomonas capsulata*
Washington Univ. St. Louis, MO 63130	Daniel H. Kohl	$100,000	08/01/85	07/31/87	Natural Abundance of ^{15}N to Indicate Pathways of Fixed N in Nodules
Univ. of Nebraska Lincoln, NE 68588	T. Adrian George	$85,000	07/01/85	06/30/87	Dinitrogen Complexes of Iron and Molybdenum with Sulfur Ligands
Boyce Thompson Inst. for Plant Res. Tower Road Ithaca, NY 14853	Thomas A. LaRue	$19,000	08/01/83	07/31/86	Host Plant Genetics and Nodule Formation

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	AGREEMENT PERIOD TO	TITLE
Battelle Memorial Institute 505 King Avenue Columbus, OH 43201	G. A. Peters	$70,000	09/15/84	09/30/86	The Azolla Anabaena Symbioses: Form and Function
Battelle Memorial Institute 505 King Avenue Columbus, OH 43201	T. V. Bhuvaneswari	$75,000	08/01/83	08/31/87	Analysis of the Natural Population of R. japonicum as Competitors and Symbionts
Battelle Memorial Institute 505 King Avenue Columbus, OH 43201	John W. McDonald	$90,000	09/01/85	08/31/87	Chemical and Spectroscopic Probes of the Metal Sites of Nitrogenase
Oregon State Univ. Corvallis, OR 97331	Lyle R. Brown	$45,000	09/01/83	08/31/86	Molecular Mechanisms Controlling Nif and Sym Genes: A Role for RNA Polymerase
Oregon State Univ. Corvallis, OR 97331	Peter J. Bottomley	$60,000	08/01/85	07/31/86	Factors Influencing Competition between Members of Indigenous Populations of R. trifolii
Univ. of Tennessee Knoxville, TN 37966	Beth C. Mullin	$30,266	08/01/85	07/31/86	Organization and Expression of Leghemoglobin-like Sequences in Alnus Glutinosa

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL NITROGEN FIXATION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Univ. of Texas at Austin Austin, TX 78712	Fred R. Tabita	$110,000	08/01/83	07/31/87	Recovery of Nitrogenase from Oxygen Inactivation
Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061	Dennis R. Dean	$90,000	09/01/85	08/31/87	Organization and Expression of Structural Genes for Nitrogenase from *Azotobacter Vinelandii*
Univ. of Wisconsin Madison, WI 53706	Paul W. Ludden	$105,000	09/01/85	08/31/87	Non-genetic Regulation of Nitrogenase in Photosynthetic Bacteria
Univ. of Wisconsin Madison, WI 53706	Eldon H. Newcomb	$95,000	07/01/85	06/30/87	Structure and Function in Bean Root Nodules Induced by Mutant Rhizobia
Marquette Univ. Milwaukee, WI 53233	Kenneth D. Noel	$80,000	07/01/85	06/30/87	Rhizobium Genes for Root Nodule Development

TOTAL $3,060,000

Biological Stress on Plants

Research grants in this area support studies on stresses on plants arising from their interactions with other plants or with other biological agents such as weeds, insects, nematodes, fungi, bacteria, viruses and mycoplasma-like organisms. The ultimate goal is to reduce losses in plant productivity from damage caused by biologically generated stresses.

Emphasis in this area is on studies that will enhance understanding of how stressful interactions are established between plants and other biological agents; how such interactions are influenced by environmental and other factors inherent to the interacting organisms; how the interactions reduce plant productivity and usefulness to man; how plants react to stress generated by such interactions; and how damage from such interactions may be reduced or eliminated.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Arkansas Fayetteville, AR 72701	Rose Gergerich	$119,000	07/01/85	06/30/87	Ribonuclease in Beetle Regurgitant as a Determinant in Plant Virus Transmission
Univ. of Arkansas Fayetteville, AR 72701	Seth Y. Young	$70,000	09/15/83	09/30/87	Baculovirus Transmission in *Anticarsia gemmatalis* Populations on Soybean
Northern Arizona Univ. Flagstaff, AZ 86011	Thomas Whitham	$40,000	07/15/84	07/31/86	The Interaction of Environmental Stress and Herbivory on Pinyon Pine, *Pinus edulis*
Univ. of Arizona Tucson, AZ 85721	Michael McClure	$50,000	07/01/84	06/30/86	Isolation and Characterization of Stylet Exudates from Root-Knot Nematodes
Univ. of California Davis, CA 95616	John M. Duniway	$50,000	07/01/85	06/30/86	Influence of Environmental Stresses on the Development and Impact of Phytophthora Root Rot
Univ. of California Davis, CA 95616	William Timberlake	$50,000	09/01/84	08/31/86	Development of Molecular Cloning Vectors for Filamentous Fungi

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of California Davis, CA 95616	Sean S. Duffey	$50,000	08/01/84	07/31/86	Biochemical Facets of Antibiosis of Tomatoes Against Noctuid Larvae
Univ. of California Davis, CA 95616	George Bruening	$50,000	09/15/84	09/30/86	Antiviral Action of Satellite RNA
Univ. of California Riverside, CA 92521	Edward Platzer	$50,000	09/01/85	08/31/86	Molecular Diagnostics of Plant Parasitic Nematodes
The Salk Inst. for Biological Studies P.O. Box 85800 San Diego, CA 92138	Christopher Lamb	$50,000	09/15/84	09/30/86	Molecular Biology of the Phytoalexin Defense Response
Univ. of California Santa Cruz, CA 95064	L. R. Fox	$90,000	06/01/85	05/31/87	Fertilizer-Community Interactions Affecting Brassica Productivity
Univ. of Delaware Newark, DE 19711	Thomas K. Wood	$90,000	08/01/85	07/31/87	Insect Phenology Mediated by Host Plant Water Relations

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Florida Gainesville, FL 32611	Michael J. Davis	$70,000	07/01/85	06/30/87	Host-Pathogen Interactions in Ratoon Stunting Disease of Sugarcane
Univ. of Florida Gainesville, FL 32611	Simon S. J. Yu	$70,000	07/15/85	07/31/87	Detoxication of Allelochemicals by Herbivorous Insects
Agricultural Research Service, USDA P.O. Box 70, RR #2 Ames, IA 50010	Karl J. Kramer	$90,000	09/15/85	09/30/88	Insect Control by Manipulation of Cuticle Destabilizing Enzymes
Iowa State Univ. of Science & Technology Ames, IA 50011	Larry P. Pedigo	$50,000	06/01/83	05/31/87	Plant and Strand Response to Early Season Insect-induced Stresses
Loyola Univ. of Chicago Chicago, IL 60611	S. K. Farrand	$50,000	09/01/84	08/31/86	Crown Gall Control: Plasmid Engineering to Maximize Control and Minimize Failures
Univ. of Illinois Urbana, IL 61801	Gilbert Waldbauer	$90,000	06/01/83	08/31/87	Corn Earworm: Self Selection of Nutrient Balance on Natural and Defined Diets

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Purdue Res. Fdn. West Lafayette, IN 47907	Avtar K. Handa	$85,000	07/01/85	06/30/87	Molecular Cloning of Pathogenicity Genes of *Erwinia carotovora*
Purdue Res. Fdn. West Lafayette, IN 47907	David N. Kuhn	$45,000	07/01/83	12/31/86	Genes for Gene Theory and the Role of Recognition in Soybean Disease Resistance
Purdue Res. Fdn. West Lafayette, IN 47907	Larry L. Murdock	$100,000	09/01/85	08/31/87	Central Nervous Control of Insect Feeding Behavior
Univ. of Kentucky Lexington, KY 40546	M. R. Siegel	$75,000	06/01/85	05/31/87	Endophytic Fungi: Harmful and Beneficial Effects on Forage and Turf Grasses
Univ. of Kentucky Lexington, KY 40506	David A. Smith	$85,000	09/15/83	09/30/87	Phytoalexin Detoxification as a Determining Characteristic of Fungal Virulence
Univ. of Kentucky Res. Fdn. Lexington, KY 40506	John G. Shaw	$45,000	07/01/85	06/30/86	Viral Gene Expression in Potyvirus Infections

AVAILABLE

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COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Kentucky Res. Fdn. Lexington, KY 40536	R. E. Rhoads	$85,000	07/01/85	06/30/87	Characterization of dsRNA in Hypovirulent Strains of *Endothia parasitica*
Univ. of Kentucky Res. Fdn. Lexington, KY 40506	Juan G. Rodriguez	$80,000	08/01/83	07/31/87	Quantification of Plant Stress and Soybeans by Spider Mites
Univ. of Kentucky Res. Fdn. Lexington, KY 40506	T. P. Pirone	$50,000	05/15/83	05/31/86	Nature and Mode of Action of the Potyvirus Helper Component
Louisiana State Univ. & A&M College Baton Rouge, LA 70803	Ding S. Shih	$85,000	08/01/85	07/31/87	Plant Viral Protein Processing Enzymes and Specific Inhibitors
Univ. of Massachusetts Amherst, MA 01003	Ronald Prokopy	$91,000	09/15/85	09/30/87	Host-finding Dynamics of Apple Maggot Flies
Harvard College Cambridge, MA 02138	Arthur Ayers	$80,000	07/01/85	06/30/87	Plant Recognition of Pathogen Components (Elicitor)

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Univ. of Maine at Orono Orono, ME 04469	Stellos Tavantzis	$50,000	07/01/84	06/30/86	Biological Control by Transmissible Hypovirulence in *Rhizoctonia solani*
Michigan State Univ. East Lansing, MI 48824	James Miller	$50,000	06/01/83	05/31/86	Quantifying Sensory Determinants Mediating Oviposition by the Onion Fly
Michigan State Univ. East Lansing, MI 48824	R. Hammerschmidt	$80,000	06/01/85	05/31/87	Regulation and Localization of Induced Resistance in *Cucumis*
Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401	Alan P. Roelfs	$45,000	07/01/85	06/30/86	Genetic Diversity in Sexual and Asexual Populations of Rust Fungi in Agroecosystems
Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401	William Bushnell	$80,000	09/15/85	09/30/87	Locating Race-specific Incompatibility Events in Powdery Mildew of Barley
Washington Univ. St. Louis, MO 63130	Joseph Varner	$65,000	07/01/83	06/30/87	The Role of Hydroxyproline-rich Glycoproteins in Plant Response to Stress

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
North Carolina State Univ. Raleigh, NC 27695	Richard Roe	$80,000	09/01/85	08/31/87	Regulation of Juvenile Hormone Esterase -- New Biodegradable Insecticides
North Carolina State Univ. Raleigh, NC 27695	George Kennedy	$50,000	07/01/85	06/30/86	Mechanisms of Multiple Insect Resistance in Wild Tomato Species
North Carolina State Univ. Raleigh, NC 27695	Jeng-sheng Huang	$90,000	07/01/85	06/30/87	Iron Metabolism in Relation to Nematode-suppressed Nodule Development in Soybean
Agric. Expt. Station Univ. of Nebraska Lincoln, NE 68583	J. M. Daly	$50,000	07/01/85	06/30/86	Identification of Host Resistance or Susceptibility to Toxins
Univ. of Nevada Reno, NV 89557	Gary Blomquist	$50,000	07/01/85	06/30/86	Biosynthesis of Insect Hydrocarbons - Potential for Insect Control
Boyce Thompson Inst. for Plant Research Tower Road Ithaca, NY 14853	V. Macko	$77,982	09/01/85	08/31/87	Characterization of Receptor Sites of Host-Selective Toxins from *Helminthosporium victoriae*

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Boyce Thompson Inst. for Plant Research Tower Road Ithaca, NY 14853	Patrick Hughes	$40,000	09/01/84	08/31/86	Quantitation of Viral Pesticide Infectivity and Pathogenicity
Cornell Univ. Ithaca, NY 14853	James R. Aist	$70,000	09/01/85	08/31/87	Calcium Regulation in Secretion and Disease Resistance
Cornell Univ. Ithaca, NY 14853	O. C. Yoder	$70,000	09/15/84	09/30/87	Utility of Cochliobolus of Plasmids for Vector Construction
Ohio State Univ. Res. Fdn. Columbus, OH 43212	Lawrence Madden	$75,000	09/01/85	03/31/87	Rain Splash Dispersal of *Phytophthora cactorum*
Ohio State Univ. Columbus, OH 43212	Lowell Nault	$50,000	06/15/84	06/30/86	Evolution of Leafhoppers and Stunting Pathogens with Maize and its Ancestors
Oklahoma State Univ. Stillwater, OK 74078	Richard Johnson	$90,000	06/01/83	05/31/87	Wheat Adaptations for Greenbug Resistance under Drought

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Oregon State Univ. Corvallis, OR 97331	Steven Radosevich	$65,800	09/15/85	08/31/87	Competition between Douglas-fir and Red Alder Seedlings: Resource Use, Physiology and Growth Analysis
Texas A&M Res. Fdn. College Station, TX 77843	H. Williams	$100,000	08/01/85	07/31/87	Influence of Variable Plant Chemistry on Parasitoid Attraction and Learning
Utah State Univ. Logan, UT 84322	Neal Van Alfen	$75,000	07/01/85	06/30/87	The Role of Bacterial EPS as a Virulence Factor in a Wilt Disease
Utah State Univ. Logan, UT 84322	Edith B. Allen	$90,000	06/01/83	05/31/87	Interactions of VA Mycorrhizae and Weeds: Mechanisms for Reduced Stress on Rangeland Grasses
Agric. Expt. Station Utah State Univ. Logan, UT 84322	Anne J. Anderson	$50,000	09/15/84	09/30/86	The Role of the Plant in Biological Control of Fungal Pathogens
Univ. of Virginia Charlottesville, VA 22903	James Riopel	$32,762	08/15/84	08/31/86	Host/Parasite Interactions in Parasitic Angiosperms

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COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOLOGICAL STRESS ON PLANTS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Washington Seattle, WA 98195	Eugene Nester	$50,000	08/01/84	07/31/86	Organization and Regulation of *Vir* Genes of *Agrobacterium*
Univ. of Wisconsin Madison, WI 53706	Arthur Kelman	$95,000	08/01/83	07/31/87	Resistance of Potato Tubers to Tissue Maceration by Pectolytic Enzymes
Univ. of Wisconsin Madison, WI 53706	Douglas Rouse	$95,000	07/15/85	07/31/87	Spatial Patterns of Brown Spot of Snap Beans and of *Pseudomonas syringae*
Univ. of Wisconsin Madison, WI 53706	Nelson E. Balke	$90,000	07/01/85	06/30/88	Glucosylation as a Mechanism for Detoxication of Allelopathic Chemicals by Plants
Univ. of Wisconsin Madison, WI 53706	M. T. Stephen Hsia	$100,000	07/01/85	06/30/87	Phytochemical and Toxicological Aspects of Foodplant Specialization in Lepidoptera
Univ. of Wisconsin Milwaukee, WI 53201	Kenneth Nealson	$90,000	09/01/85	08/31/87	Physiological Studies of Insect Pathogenic Bacteria in the Genus *Xenohabdus*

TOTAL $4,181,544

Genetic Mechanisms for Crop Improvement

Grants in this area are to encourage innovative or unique genetic approaches to the development of genetically superior varieties of agricultural crops. They are directed toward obtaining novel genetic combinations or gene modifications that cannot be achieved using conventional plant breeding techniques. Research areas are: acquisitions of basic information on the plant nuclear and organellar genes; development of cellular and molecular methods for identifying plant genes or traits which are important targets for genetic manipulation; development of molecular and cellular methods for crop improvement using gene transfer or genetic engineering technology; cell and tissue culture studies designed to increase our knowledge of the basic processes involved in regenerating whole plants from single cells; development of new methods for producing, selecting, and transferring agronomically important traits; and basic genetic studies on the alteration and utilization of unadapted and wild germplasm.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Univ. of California Davis, CA 95616	Richard Michelmore	$174,000	07/01/85	06/30/88	Variation in Lettuce Downy Mildew
Univ. of California Davis, CA 95616	Calvin Qualset	$85,250	06/01/85	05/31/87	Transfer of a Gene for Barley Yellow Dwarf Virus Resistance from Barley to Wheat
Univ. of California, San Diego La Jolla, CA 92093	Stephen Howell	$150,000	06/15/85	05/31/87	Complementation of Modified CaMV Genomes
Univ. of California Los Angeles, CA 90024	C. Fred Fox	$5,000	04/01/85	06/30/85	Research Conference on Plant Genetics
Univ. of California Los Angeles, CA 90024	George G. Laties	$83,000	09/15/83	09/30/87	Ethylene and Wounding Directed Gene Expression in Plant Tissues
Zoecon Corporation 975 California Avenue Palo Alto, CA 94304	Donald Weeks	$10,000	07/01/85	12/31/85	Research Conference on the Genetics and Molecular Biology of Chlamydomonas

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of California Riverside, CA 92521	Eugene Nothnagel	$94,000	07/01/85	06/30/87	Plasma Membrane-Cytoskeleton Interactions in Fused Plant Protoplasts
Yale Univ. New Haven, CT 06520	Ian M. Sussex	$171,000	05/15/85	05/31/87	Stage-specific Gene Expression in the Shoot Apex in Relation to Flowering
Carnegie Institution of Washington 1530 P. Street, N.W. Washington, D.C. 20005	William Thompson	$82,000	09/15/85	09/30/86	Isolation and Characterization of Genes Regulated by Light
Univ. of Florida Gainesville, FL 32611	R. L. Smith	$76,000	07/01/85	06/30/87	Organelle DNA Organization and Cytoplasmic Male Sterility in Pennisetum
Univ. of Florida Gainesville, FL 32611	Prem S. Chourey	$90,500	07/01/85	06/30/87	Molecular Analysis of Genomic Variability in Tissue Cultured Cells of Maize and Sorghum
Florida State Univ. Tallahassee, FL 32306	George W. Bates	$101,400	07/15/83	07/31/87	Interspecific Gene Transfer by Fusin of Irradiated Plant Protoplasts

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Agricultural Research Service, USDA P.O. Box 5677 Athens, GA 30613	Charles Stuber	$56,000	09/15/83	09/30/86	Isozyme Loci as Markers for Locating and Manipulating Quantitative Trait Loci
Univ. of Georgia Res. Fdn. Athens, GA 30602	Wayne W. Hanna	$145,000	09/15/85	09/30/88	Interspecific Transfer of Genes for Obligate Apomixis from Wild *Pennisetum* to Pearl Millet
Univ. of Illinois Urbana, IL 61801	Theodore Hymowitz	$140,000	08/15/85	08/31/88	The genus *Glycine* subgenus *Glycine*: Broadening the Genetic Base of Soybeans
Agricultural Research Services, USDA P.O. Box 70, RR #2 Ames, IA 50011	Arnel R. Hallauer	$99,100	06/01/85	05/31/90	Selection Methods for Germplasm Enhancement in Corn
Kansas State Univ. Manhattan, KS 66506	Bikram Gill	$81,000	07/01/85	06/30/87	Genome Evolution in Polyploid Species: Cytogenetic Analysis of Wheat-*Elymus* Addition Lines
Kansas State Univ. Manhattan, KS 66506	Rollin G. Sears	$17,000	07/15/84	07/31/86	Chromosomal Mapping of Genes Controlling Tissue Culture Response in Wheat

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Kansas State Univ. Manhattan, KS 66506	Lowell Johnson	$64,000	09/15/85	09/30/87	Transfer of Genetic Information into Alfalfa through Protoplast Fusion
Univ. of Kentucky Res. Fdn. Lexington, KY 40506	Glenn Collins	$78,500	07/01/85	06/30/87	Wide Hybridization and Gene Transfer in *Trifolium*
Univ. of Kentucky Res. Fdn. Lexington, KY 40546	N. L. Taylor	$56,000	09/01/83	08/31/86	Genetics and Breeding of Somaclonal Variation in Red Clover
Univ. of Maine Orono, ME 04469	Robert Roxby	$61,000	07/01/85	06/30/88	Isolation and Characterization of Potato Tuberization Genes
Agricultural Research Service, USDA Room 227, Bldg. 003, BARC-West Beltsville, MD 20705	Benjamin Matthews	$55,000	09/15/85	09/30/87	Cloning and Expression of Genes Involved in Amino Acid Biosynthesis
Univ. of Maryland Baltimore County 5401 Wilkens Avenue Catonsville, MD 21228	Madeline C. Wu	$37,000	09/01/85	08/31/86	The Replication of Chloroplast DNA in *Chlamydomonas reinhardii*

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Harvard College Cambridge, MA 02138	James Birchler	$168,400	07/01/85	06/30/88	Chromosomal Manipulation in Maize
Michigan State Univ. East Lansing, MI 48824	C. Peter Wolk	$80,000	07/01/85	06/30/87	Further Mapping of the Chromosome of *Anabaena* by a Surrogate Genetic Approach
Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401	Leonard Joppa	$36,000	09/15/85	09/30/87	The Effectiveness of Homoeologous Pairing Genes in *Triticum turgidum*, *T. aestivum*, and *T. speltoides*
Univ. of Minnesota St. Paul, MN 55104	R. L. Phillips	$76,000	08/01/85	07/31/87	Tissue Culture Genetic Systems
Washington Univ. St. Louis, MO 63130	John C. Rogers	$178,000	08/01/85	07/31/88	Regulation of Gene Expression in Barley Aleurone Cells
Univ. of Nebraska Lincoln, NE 68588	Russel H. Meints	$92,000	08/01/85	07/31/87	Development of Transformation Vectors in *Chlorella* -like Green Alga

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Res. Fdn. of State Univ. of New York Albany, NY 12201	Jeremy A. Bruenn	$50,000	09/01/85	08/31/87	Cloning and Expression of the *Ustilago maydis* Virus Toxin Gene
Cornell Univ. Ithaca, NY 14853	J. B. Nasrallah	$148,000	09/15/85	09/30/87	Molecular Genetic Analysis of the *Brassica* S Locus
Cornell Univ. 123 Day Hall Ithaca, NY 14853	Martha Mutschler	$136,000	09/01/85	08/31/87	Genetic Modification of Cytoplasmic Traits in *Brassica* Species
Cornell Univ. Ithaca, NY 14853	Steven Tanksley	$65,000	09/01/85	08/31/87	Further Development of Protein-specific Genetic Markers in Tomato
North Carolina State Univ. Raleigh, NC 27650	Harold Stalker	$30,000	09/01/83	08/31/86	Biosystematics and Utilization of *Arachis* Species to Improve Cultivated Peanuts
Ohio State Univ. Res. Fdn. Columbus, OH 43212	George Marzluf	$70,000	06/01/85	05/31/87	Genetic Transformation and Direct Cloning in *Neurospora*

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Pennsylvania State Univ. University Park, PA 16802	Charles D. Boyer	$40,000	09/01/85	03/31/87	Mutant Expression in Maize Endosperm Suspension Cultures
Univ. of Rhode Island Kingston, RI 02881	John Mottinger	$120,000	08/01/83	07/31/87	Studies on Mutations Associated with Virus Infection in Maize
Texas A&M Res. Fdn. College Station, TX 77843	William D. Park	$78,000	09/15/83	09/30/86	Regulation of Tuber Protein Synthesis in Potato
Texas A&M Res. Fdn. College Station, TX 77843	Hugh D. Wilson	$56,000	09/15/83	09/30/86	Genetic Structure of Weed-Crop Population Systems (*Cucurbita* and *Chenopodium*)
Virginia Polytech Inst. & State Univ. Blacksburg, VA 24061	Richard Veilleux	$80,850	09/01/85	08/31/87	Use of Monoploid Genotypes in Cell Cultures and Breeding Strategies for Potato
Washington State Univ. Pullman, WA 99164	Michael Thomashow	$50,000	08/01/83	07/31/86	Characterization of *Nicotiana*-pTiAg63 Related DNA Sequences

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: GENETIC MECHANISMS FOR CROP IMPROVEMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Wisconsin Madison, WI 53706	Peter H. Quail	$125,000	09/01/85	08/31/86	The Phytochrome Gene: Structure, Organization and Expression
Univ. of Wisconsin Madison, WI 53706	Richard Vierstra	$169,000	07/01/85	06/30/88	Biochemical and Molecular Characterization of Plant Ubiquitin

TOTAL $3,860,000

Photosynthesis

Grants in this area focus on a better understanding of photosynthesis and associated carbon metabolism. Photosynthesis is the process that crop plants use to convert solar energy into food products that plants and animals use for growth and development.

The program's aim is to cover such areas as the mechanisms of energy capture and conversion, structure, synthesis, and turnover of the photosynthetic apparatus, CO_2 fixation, photorespiration, and dark respiration. Other areas included in this program are projects on the relation of plant development to photosynthesis, including development of photosynthetic competence, translocation and partitioning of photosynthetic products; and design of whole leaf and whole plant structures best suited for photosynthetic productivity. Another area set forth for proposals is the design of new methods of genetic and cellular manipulation to improve photosynthetic efficiency in plants--including studies of the chloroplast genome, of nuclear genes regulating photosynthesis, and analysis of regulatory steps controlling both nuclear and cytoplasmic genome expression and their interactions.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of California Berkeley, CA 94720	Anastasios Melis	$80,000	09/01/85	08/31/87	Structural Differentiation and Functional Organization in Higher Plant Chloroplasts
Univ. of California Davis, CA 95616	Mark Matthews	$75,000	09/01/85	08/31/87	Physiological Mechanisms of Photosynthetic Acclimation to Water Deficits
Univ. of California Davis, CA 95616	Robert Pearcy	$70,000	07/01/85	06/30/87	Dynamic Responses of Photosynthesis to Variable Light
San Francisco Operations Office U. S. Department of Energy Oakland, CA 94612	Kenneth Sauer	$120,000	09/01/85	08/31/87	Electron Spin Echo Spectroscopy in Photosynthesis
Univ. of Denver (Colorado Seminary) University Park Denver, CO 80208	Steven Berg	$70,000	06/01/85	05/31/87	The Use of Polyclonal Antibodies to Study the Topology of Three Thylakoid Protein Complexes

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Agricultural Research Service, USDA 2625 Redwing Road Ft. Collins, CO 80526	Roger Wyse	$45,000	09/01/84	03/31/86	Control Mechanisms for Photosynthate Partitioning in Sugarbeet
Univ. of Miami Coral Gables, FL 33124	Roger E. Fenna	$25,678	09/01/85	08/31/86	Structural Studies of Chlorophyll-Protein Complexes
Agricultural Research Service, USDA P.O. Box 5677 Athens, GA 30613	Steven Huber	$80,000	06/01/85	05/31/87	Mechanisms for Control of Photosynthetic Sucrose Formation
Iowa State Univ. of Science & Technology Ames, IA 50011	Martin Spalding	$75,000	08/15/85	08/31/87	Chlamydomonas Mutants Defective in the CO_2-concentrating Pathway
Univ. of Chicago Chicago, IL 60637	Robert Haselkorn	$111,972	07/01/85	06/30/87	Molecular Genetic Analysis of the Photosynthetic Apparatus in Cyanobacteria
Univ. of Chicago Chicago, IL 60637	Gayle Lamppa	$75,000	07/01/85	06/30/87	Molecular Basis of the Selective Transport of Proteins into Chloroplasts

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Health Sciences The Chicago Medical School 3333 Green Bay Rd. North Chicago, IL 60064	Frank Marcus	$115,000	09/01/83	08/31/87	Light Regulated Enzymes of Photosynthetic Carbon Assimilation
Kansas State Univ. Manhattan, KS 66506	James Guikema	$28,925	09/15/83	09/30/86	Development of Lipid-Protein Complexes in *Anacystis* Membranes
Kansas State Univ. Manhattan, KS 66506	James Guikema	$33,925	09/15/83	09/30/87	Development of Lipid-Protein Complexes in *Anacystis* Membranes
Harvard College Cambridge, MA 02138	Lawrence Bogorad	$60,000	09/01/85	08/31/86	Genes for Photosynthesis in Corn
Univ. of Michigan Ann Arbor, MI 48109	R. R. Scharp	$90,000	09/01/83	08/31/87	Amino Acids at the Active Site of CF_1, a Spin-echo nmr Study
Michigan State Univ. East Lansing, MI 48824	C. Somerville	$64,500	07/15/83	07/31/86	Directed Genetic Modification of RuBP Carboxylase/Oxygenase

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Washington Univ. St. Louis, MO 63130	Dewey Holten	$100,000	09/01/85	08/31/87	Ultrafast Spectroscopic Studies of Photosynthetic Electron Transfer
Agric. Expt. Station Univ. of Nebraska Lincoln, NE 68583	Raymond Chollet	$90,000	09/01/85	08/31/87	Regulation of Pyruvate, Pi Dikinase Activity
Agric. Expt. Station Univ. of Nebraska Lincoln, NE 68588	Robert Spreitzer	$75,000	06/15/85	05/31/87	Genetic Modification of RuBP Carboxylase/Oxygenase in *Chlamydomonas reinhardii*
Rutgers, The State Univ. New Brunswick, NJ 08903	Barbara Zilinskas	$85,000	06/01/85	05/31/87	Structure and Function of Cyanobacterial Photosynthetic Systems
Rutgers, The State Univ. New Brunswick, NJ 08903	Carl A. Price	$75,000	07/01/85	06/30/87	Translational Regulation in Chloroplasts
Cornell Univ. Ithaca, NY 14853	Richard McCarty	$110,000	09/01/83	08/31/87	The Glycolate Transporter of the Chloroplast Envelope

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Cornell Univ. Ithaca, NY 14853	Andre Jagendorf	$55,000	09/15/85	09/30/86	Chloroplast Proteins: Synthesis, Degradation and Controls
The Rockefeller Univ. New York, NY 10021	Anthony Cashmore	$120,000	08/01/83	07/31/87	Characterization of Plant Genes Encoding Photosynthetic Membrane Proteins
Rensselaer Polytechnic Inst. Troy, NY 12180	John Salerno	$80,000	07/01/85	06/30/87	Electron Transfer and Energy Conservation in Chloroplasts
Brookhaven National Laboratory U.S. Department of Energy Upton, NY 11973	John Bennett	$90,000	09/01/85	08/31/87	Biosynthesis, Structure and Assembly of the Reaction Center of Photosystem 2
Brookhaven National Laboratory U. S. Department of Energy Upton, NY 11973	G. Hind	$80,000	09/01/85	08/31/87	Photosynthetic Mechanisms in Nitrogen-fixing Heterocysts of Cyanobacteria

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Brookhaven National Laboratory U.S. Department of Energy Upton, NY 11973	John Bennett	$55,000	09/01/84	08/31/86	Chloroplast Protein Kinases and the Regulation of Photosynthesis
Pennsylvania State Univ. University Park, PA 16802	S. Stevens, Jr.	$60,000	09/01/85	12/31/86	Directed Mutagenesis of the Ribulose Bisphosphate Carboxylase Small Subunit
Pennsylvania State Univ. University Park, PA 16802	J. Shannon	$90,000	09/01/85	08/31/87	Mechanism(s) of Assimilate Absorption into the Endosperm of *Zea mays* L. Kernels
Gordon Research Conferences c/o Univ. of Rhode Island Gordon Research Ctr. Kingston, RI 02881	Gerald Babcock	$5,000	07/01/85	03/31/86	Gordon Research Conference on Physicochemical Aspects of Photosynthesis
Brown Univ. Providence, RI 02912	John Biggins	$90,000	09/01/85	08/31/87	Regulation of Excitation Energy Distribution in the Phycobilin - Chlorophyll Systems

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Brown Univ. Providence, RI 02912	John Biggins	$10,000	09/01/85	08/31/87	Partial Support of the VII International Congress on Photosynthesis
Univ. of South Carolina Columbia, SC 29208	Anthony Huang	$90,000	08/01/83	07/31/87	Metabolic Control in Peroxisomes and Mitochondria in Photorespiration
Univ. of Texas at Austin Austin, TX 78712	F. Robert Tabita	$110,000	09/01/83	08/31/87	Bacterial Genes Coding for Plant Ribulose Bisphosphate Carboxylase/Oxygenase
Texas Tech Univ. Lubbock, TX 79409	David Knaff	$60,000	09/01/85	08/31/86	Protein Complexes in Photosynthetic Electron Transfer Reactions
Texas Tech Univ. Lubbock, TX 79409	Allan S. Holaday	$75,000	06/01/85	05/31/87	Controls on the Development of C_4 Photosynthesis in C_3 x C_4 Flaveria F_1 Hybrids
Univ. of Wisconsin Madison, WI 53706	Marion O'Leary	$115,000	09/01/83	08/31/87	Mechanism of Action of Phosphoenolpyruvate Carboxylase

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PHOTOSYNTHESIS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Wisconsin Madison, WI 53706	John Markley	$120,000	09/01/85	08/31/87	Mechanisms of Electron Transport in Photosynthesis

TOTAL $3,060,000

HUMAN REQUIREMENT FOR NUTRIENTS

The emphasis in this program area is on determining human requirements for nutrients. Support is not provided for clinical research or for demonstration or action projects.

Research in human nutrition contributes to improving human nutritional status by increasing our understanding of requirements for nutrients in relation to different patterns of food intake. Findings help fill the gaps of our knowledge related to nutrient requirements, bioavailability, the interrelationships of nutrients, and the nutritional value of foods consumed in the United States as they relate to these requirements. Special attention in this program area is given to the study of trace constituents of foods and their effect on human health.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Arizona Tucson, AZ 85721	Roger A. Sunde	$50,000	07/01/85	06/30/86	Selenomethionine Metabolism and Utilization
Agricultural Research Service, USDA 800 Buchanan Street Albany, CA 94710	Judith R. Turnlund	$70,000	09/15/85	09/30/86	Use of Stable Isotopes to Determine Dietary Requirements of Zn, Cu, Fe, Ca, and Mg
Univ. of California Berkeley, CA 94720	Janet C. King	$40,000	08/01/85	07/31/86	Dietary Induced Thermogenesis in the Obese Pregnant Woman
Univ. of California Davis, CA 95616	Bo Lonnerdal	$60,000	09/01/85	08/31/86	Manganese Absorption in Humans
Univ. of California Los Angeles, CA 90024	Isabelle F. Hunt	$75,000	09/01/83	08/31/86	Diet and Bone Mineral Density in Women Aged 50-79 Years
Colorado State Univ. Ft. Collins, CO 80523	Gustav R. Jansen	$70,000	09/01/85	08/31/86	Mechanisms by which Dietary Protein and Amino Acids Control Lactation

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Georgetown Univ. Washington, D.C. 20057	Margit Hamosh	$36,000	09/15/85	09/30/86	Milk Lipases in Delivery and Digestion of Fat in Infants: An Animal Model
George Washington Univ. Washington, D.C. 20052	George V. Vahouny	$100,000	08/01/85	07/31/87	Dietary Fibers and Intestinal Function: Structure-Function Correlations
Fort Wayne State Hospital & Training Center Ft. Wayne, IN 46815	Stephen P. Coburn	$100,000	09/15/85	09/30/88	Quantitative Assessment of Vitamin B_6 Metabolism in Man with Stable Isotopes
Purdue Res. Fdn. West Lafayette, IN 47907	Robert DiSilvestro	$55,600	09/01/85	08/31/87	Evaluation of Current and Newly Proposed Methods of Copper Status Assessment
Purdue Res. Fdn. West Lafayette, IN 47907	S. Suzanne Nielsen	$110,000	09/15/85	09/30/87	Resistance of Legume Proteins to Proteolysis
Purdue Res. Fdn. West Lafayette, IN 47907	Jon A. Story	$70,000	09/01/83	08/31/86	Mechanisms of Alteration of Bile Acid Excretion by Dietary Fiber

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Boston Univ. Boston, MA 02215	Steven H. Zeisel	$50,000	09/01/85	08/31/87	Is Choline an Essential Nutrient for Humans?
Massachusetts General Hospital Boston, MA 02114	Susan S. Baker	$45,000	08/01/85	07/31/86	Effect of Malnutrition on Barrier Function of Gastrointestinal Microvillus Membrane
Massachusetts Inst. of Technology Cambridge, MA 02139	Vernon R. Young	$100,000	09/15/84	09/30/86	A Novel Approach for Study of Human Amino Acid Metabolism and Dietary Requirements
Massachusetts Inst. of Technology Cambridge, MA 02139	George Wolf	$90,000	09/01/85	08/31/87	Biochemical Reasons for the Requirement of Vitamin A in the Mammalian Organism
Johns Hopkins Univ. Baltimore, MD 21218	Tomas R. Guilarte	$36,000	09/01/85	08/31/86	Maternal Vitamin B-6 Nutrition: Effects on the Dopaminergic System of Progeny
Univ. of Missouri Columbia, MO 65211	Calvin W. Woodruf	$65,000	08/15/84	08/31/86	Vitamin A Requirements of Preterm Infants

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Cornell Univ. Ithaca, NY 14853	Steven D. Mercurio	$55,000	09/01/85	08/31/87	Influences of Dietary Mercaptans on the Biological Function of Selenium
Cornell Univ. Ithaca, NY 14853	John E. Kinsella	$80,000	07/15/82	09/30/86	Antithrombotic Action of n3 Polyunsaturated Acids: Optimum Intake and Effects on Prostaglandins
St. Luke's-Roosevelt Inst. for Health Science 114th St. & Amsterdam Ave. New York, NY 10025	F. X. Pi-Sunyer	$60,000	07/01/85	06/30/86	Chromium Absorption and Assessment
Duke Univ. Durham, NC 27706	Jean L. Johnson	$68,000	07/01/85	06/30/86	Role of Molybdenum and the Molybdenum Cofactor in Human Health and Nutrition
Oklahoma State Univ. Stillwater, OK 74078	Eldon C. Nelson	$90,000	08/15/85	08/31/87	Metabolism of Retinoids
Univ of Texas at Austin Austin, TX 78712	J. Freeland-Graves	$35,000	07/15/84	07/31/86	Manganese: Assessment of Requirements and Functions

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Vermont & State Agric. College Burlington, VT 05405	Elliot Danforth	$80,000	08/01/83	07/31/86	Diet-induced Alterations in Thyroid Hormone Metabolism and Nutritional Requirements
Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061	Mark L. Failla	$60,000	09/01/85	08/31/86	Influence of Obesity on Zinc and Iron Metabolism
Virginia Commonwealth Univ. Richmond, VA 23298	Gregory S. Head	$70,000	09/01/85	08/31/87	Bioavailability and Requirements of Biotin for infants and Children
Univ. of Wisconsin Madison, WI 53706	Frank R. Greer	$100,000	09/01/85	08/31/87	The Vitamin D Requirements of Breast-fed Infants in the United States

TOTAL $1,920,600

BIOTECHNOLOGY

It is widely acknowledged that biotechnological research offers direct access to new, potentially valuable high technology opportunities for agriculture and food production. Recent discoveries in molecular genetics and their successful applications show that "high technology in biology" is applicable to agriculture and food and they contribute significantly to "the molecular revolution" that is basic to many of our industries. The new biotechnological research capabilities -- particulary those that build on advances in molecular biology -- have particular advantages for agriculture. They provide a new basis for changing plant and animal productivity and performance on the basis of the directed modification of specified genes and gene systems.

This new capability offers exceptional promise, but it cannot be effective unless it is closely integrated with basic science disciplines such as biochemistry, physiology, taxonomy, ecology and key agriculture disciplines such as plant and animal breeding, agronomy, horticulture, plant pathology, and entomology. In recognizing these needs, the overall goal of the Biotechnology Program is to support research aimed at establishing a thorough understanding of fundamental biological processes in animals, plants and associated microorganisms that may provide the basic scientific knowledge needed for the development and application of the new biotechnological research capability to agriculture and food.

Three research areas are emphasized: (1) molecular biology, (2) molecular and celluler mechanisms of growth and development, and (3) genetic and molecular mechanisms controlling responses to environmental and biological stress.

In Fiscal Year 1985, six review panels were assembled to evaluate proposals submitted to the Biotechnology Program. The grants awarded in this program are listed below by review panel.

Biotechnology-Plant Molecular Biology

The primary objective of the sub-area, plant molecular biology, is to increase our understanding of the structure, function, regulation, and expression of genes of plant and the associated microbial systems. This program area emphasizes the following categories of research: (1) identification, isolation, and characterization of genes and gene products, (2) relationships between gene structure and function, (3) regulatory mechanisms of gene expression, (4) interactions between nuclear and organellar genes, and between extrachromosomal and chromosomal genes, (5) mechanisms of gene recombination and transposition, (6) molecular basis of chromosomal replication, and (7) mechanisms of interaction with beneficial or deleterious microorganisms.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT FROM	PERIOD TO	TITLE
Univ. of California Berkeley, CA 94720	Andrew O. Jackson	$240,000	09/01/85	08/31/87	Structure, Pathology, and Genetics of Barley Stripe Mosaic Virus
Univ. of California, San Diego La Jolla, CA 92093	Stephen H. Howell	$120,000	09/01/85	08/31/87	Stability of DNA Introduced into Plants
Univ. of California Los Angeles, CA 90024	R. B. Goldberg	$240,000	08/15/85	08/30/87	Regulatory Sequences Controlling Viral-induced Gene Expression in Tobacco
Stanford Univ. Stanford, CA 94305	Virginia Walbot	$170,000	09/15/85	09/30/87	Expression of Maize Mitochondrial Genome
Colorado State Univ. Ft. Collins, CO 80523	Craig C. Schenck	$124,731	09/15/85	09/30/87	Structure-Function Relationships in Chlorophyll Binding Proteins
Carnegie Institution of Washington 1530 P Street, N.W. Washington, D.C. 20005	William Thompson	$100,000	09/15/85	09/30/87	Photoregulated Gene Expression in Chloroplasts

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Florida Gainesville, FL 32611	Daryl R. Pring	$100,000	09/01/85	08/31/87	Cosmid Mapping of Mitochondrial DNA of Male Fertile and Male Sterile Sorghum
International Society for Plant Molecular Biology Athens, GA 30602	Leon Dure, III	$7,500*	09/01/85	02/28/86	First International Congress of Plant Molecular Biology
Univ. of Georgia Res. Fdn. Athens, GA 30602	Richard Meagher	$170,000	09/15/85	09/30/87	Expression of Soybean Nuclear Genes in Transgenic Plants
Univ. of Illinois Urbana, IL 61801	S. Kaplan	$200,000	09/15/85	09/30/87	Synthetic Deoxyoligonucleotide - Directed Analysis of Gene Control in Photosynthesis
Univ. of Illinois Urbana, IL 61801	Mary A. Schuler	$190,000	09/01/85	08/31/87	Plant Cytochromes P-450: Regulation of Gene Expression
Univ. of Kentucky Res. Fdn. Lexington, KY 40506	Arthur G. Hunt	$140,000	09/01/85	08/31/87	Gene Expression in Plants: A Characterization of Plant Polyadenylation Signals

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COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Kentucky Res. Fdn. Lexington, KY 40506	Robert J. Shepherd	$100,000	09/01/85	08/31/87	Complementation Among Caulimoviruses
Univ. of Michigan Ann Arbor, MI 48109	Jeffrey D. Palmer	$100,000	09/15/85	09/30/87	Repeated DNA Sequences and Chloroplast DNA Instability in Clover
Univ. of Minnesota St. Paul, MN 55104	Carolyn D. Silflow	$190,000	09/15/85	09/30/87	Tubulin Genes in Higher Plants
Washington State Univ. St. Louis, MO 63130	Ursula Goodenough	$150,000	09/15/85	09/30/87	Hydroxyproline-Rich Glycoproteins: Sequences, Interactions, and Evolution
Agricultural Research Service, USDA P.O. Box 225, Stoneville Road Stoneville, MS 38776	Kenneth C. Ehrlich	$100,000	09/15/85	09/30/87	Plant Proteins Involved in Regulating Gene Expression through DNA Methylation
Univ. of New Hampshire Durham, NH 03824	Anita S. Klein	$140,000	09/15/85	09/30/87	Tissue-specific Gene Regulation in Maize

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of North Carolina Chapel Hill, NC 27514	Ann G. Matthysse	$100,000	09/15/85	09/30/87	Characterization and Use of Agrobacterium Genes for Attachment to Plant Cells
Rutgers, The State Univ. New Brunswick, NJ 08903	Daniel F. Klessig	$110,000	09/15/85	09/30/87	Regulation of Pathogenesis-related Proteins Synthesis in *Nicotiana*
Cold Spring Harbor Laboratory P.O. Box 100 Cold Sprg. Harbor, NY 11724	Stephen Dellaporta	$124,000	09/01/85	08/31/87	Changes in *Waxy* Gene Activity by Excision of a *DS* Element
Cornell Univ. Ithaca, NY 14853	O. C. Yoder	$140,000	09/01/85	08/31/87	Transposable Elements in Filamentous Fungi
Cornell Univ. Ithaca, NY 14853	Maureen R. Hanson	$114,000	09/01/85	08/31/87	Regulation of Mitochondrial Gene Expression
Univ. of Oregon Eugene, OR 97403	William Sistrom	$50,269	09/15/85	09/30/87	Structure-Function-Relations in Chlorophyll Binding Proteins

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Texas A&M Res. Fdn. P.O. Box 3578 College Station, TX 77843	William D. Park	$190,000	09/01/85	08/31/87	Cis-Acting Factors Regulating the Expression of Patatin Genes of Potato
Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061	Dennis R. Dean	$188,000	09/15/85	09/30/87	Genetic and Biochemical Analysis of the nifEN Genes and their Products from Azotobacter
Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061	Kriton K. Hatzios	$70,000	09/15/85	09/30/87	Molecular Bioiogy of the Enhanced Degradation of Thiocarbamate Herbicides by Soil Microorganisms
Washington State Univ. Pullman, WA 99164	Gynheung An	$145,000	09/01/85	08/31/87	Introduction of Useful Traits into Crop Plants by Genetic Engineering
Univ. of Washington Seattle, WA 98195	Arnold J. Bendich	$46,500	09/15/85	09/30/86	Genetic Transformation for Plant Mitochondrial Genes
Univ. of Wisconsin Madison, WI 53706	William Reznikoff	$110,000	09/01/85	08/31/87	Promoters Controlled by Anaerobiosis

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Wisconsin Madison, WI 53706	Richard A. Spritz	$130,000	09/15/85	09/30/87	RNA Processing of Higher Plants

TOTAL $4,100,000

* Total award amount of $10,000 was split-funded with Response to Biological Stress contributing the remaining $2,500.

Biotechnology-Animal Molecular Biology

The basic objective of this sub-program area is to increase our knowledge and understanding of the structure, function, regulation and expression of animal, viral and microbial genomes. These include research in the broad areas of virology, immunogenetics, bacteriology, parasitology, genetics, infectious disease, endocrinology, gene transfer and germline integration of exogenous genes, and molecular biology of genes of cellular or animal origin. The priorities are given to those studies that will yield fundamental information which may ultimately aid in improving the biological efficiency and disease resistance in domestic animals.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Auburn Univ. Auburn University, AL 36849	Rex A. Dunham	$61,500	09/15/85	09/30/87	Gene Transfer and Expression in Catfish via Gynogenesis
Stanford Univ. Stanford, CA 94305	Gary K. Schoolnik	$238,600	08/15/85	08/31/87	Moraxella bovis pili. Molecular and Genetic Studies
Colorado State Univ. Ft. Collins, CO 80523	B. J. Beaty	$100,000	09/15/85	09/30/87	Transposition of Genes into Mosquito Genomes to Control Vector Potential
Colorado State Univ. Ft. Collins, CO 80523	Ralph E. Smith	$100,000	09/15/85	09/30/87	Molecular Cloning of Avian Leukosis Viruses
Univ. of Florida Gainesville, FL 32611	Guy H. Palmer	$126,000	09/15/85	09/30/87	Development of a Bovine Leukemia Virus Subunit Vaccine
Univ. of Georgia Res. Fdn. Athens, GA 30602	Benjamin Brackett	$150,000	09/01/85	08/31/87	Use of Retroviral Promoters for Heterologous Gene Expression in Animals

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Iowa State Univ. of Science & Technology Ames, IA 50011	Carol M. Warner	$100,000	09/15/85	09/30/87	Molecular Analysis of the Chicken Major Histocompatibility Complex
Agricultural Research Service, USDA P.O. BOX 70, RR #2 Ames, IA 50010	Harley W. Moon	$79,000	09/01/85	08/31/87	Genetically Engineered Live Oral Pilus Vaccine for Postweaning *E. coli* Infection of Swine
Rush-Presbyterian-St. Luke's Medical Center Chicago, IL 60612	Thomas Schnitzer	$115,000	09/15/85	09/30/87	Molecular Basis of Avian Reovirus Disease
Univ. of Illinois Chicago, IL 60680	Katherine Knight	$105,000	09/01/85	08/31/87	Structure and Organization of Bovine Immunoglobulin Genes
Univ. of Illinois Urbana, IL 61801	Deoki N. Tripathy	$100,000	09/01/85	08/31/87	Fowlpox Virus as a Cloning Vector for Poultry Pathogens
Louisiana State Univ. & A&M College Baton Rouge, LA 70803	Ronald Montelaro	$100,000	09/15/85	09/30/87	EIAV Provirus: Structure, Expression, and Diagnostic Potential

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Amherst College Amherst, MA 01002	Richard Goldsby	$239,700	08/15/85	08/31/88	Cloning Bovine Ig Genes and their Use to Construct Functional Chimeric Molecules
Agricultural Research Service, USDA Room 227, Bldg. 003, BARC-West Beltsville, MD 20705	Joan K. Lunney	$146,500	09/01/85	08/31/87	Enhancement of Disease Resistance in Genetically Engineered Swine
Michigan State Univ. East Lansing, MI 48824	Leland F. Velicer	$102,000	09/15/85	09/30/87	Marek's Disease Herpesvirus Molecular Biology: Secretory Glycoprotein Gene Analysis
Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401	Larry D. Bacon	$101,700	09/15/85	09/30/88	Isolation and Analysis of Chicken MHC Class II Genes and Relation to Disease
Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401	Lucy F. Lee	$137,000	09/01/85	08/31/88	Transforming Genes and Gene Products of Oncogenic Marek's Disease Virus

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401	Lyman Crittenden	$90,000	09/01/85	08/31/87	Gene Transfer to the Germline of Chicken Using Retroviral Vectors
Agricultural Research Service, USDA 220 2nd Street South, 1st Floor Minneapolis, MN 55401	Robert F. Silva	$70,500	09/01/85	08/31/87	Bioengineering Avian Herpesviruses to Construct Live Recombinant DNA Vaccines
Univ. of Missouri Columbia, MO 65211	Kim S. Wise	$140,000	09/01/85	08/31/87	Immunologic and Molecular Genetic Determinants in Mycoplasmal Pneumonia of Swine
North Carolina State Univ. Raleigh, NC 27695	Todd Klaenhammer	$104,000	09/15/85	09/30/87	Transfer, Expression, and Clonng of Phage Resistance Genes in Lactic Streptococci
North Carolina State Univ. Raleigh, NC 27695	Walter Dobrogosz	$126,400	09/01/85	08/31/87	Plasmid Biology of *Lactobacillus plantarum*
Univ. of Nevada Reno, NV 89557	Stuart T. Nichol	$129,700	09/15/85	09/30/87	A Molecular Approach to Vesicular Stomatitis Epizootiology, Disease and Control

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Cornell Univ. Ithaca, NY 14853	Gary M. Dunny	$100,000	09/15/85	09/30/87	Bacteriophage Resistance in Dairy Streptococci
Columbia Univ. in the City of New York New York, NY 10027	Martin Chalfie	$102,000	09/01/85	08/31/87	Genetic and Molecular Analysis of Drug Resistance in Caenorhabditis elegans
Univ. of Cincinnati Cincinnati, OH 45221	Jeffrey Robbins	$100,000	09/01/85	08/31/87	Gene Regulation of the Major Muscle Protein, Myosin, in Domestic Poultry
Ohio State Univ. Res. Fdn. Columbus, OH 43212	D. N. Foster	$100,000	09/01/85	08/31/87	Isolation and Structural Organization of the Chicken Gonadotrophic Genes
Agricultural Research Service, USDA 600 East Mermaid Lane Philadelphia, PA 19118	Marvin Grubman	$70,000	09/15/85	09/30/87	Study of Foot-and-Mouth Disease Virus Assembly and Neutralizing Antigenic Determinants
Texas A&M Res. Fdn. College Station, TX 77843	James Womack	$147,000	09/01/85	08/31/87	Molecular and Somatic Cell Genetics: Mapping the Cattle Genome

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Washington State Univ. Pullman, WA 99164	Gary H. Thorgaard	$100,000	09/15/85	09/30/87	Gene Transfer in Fish by Sperm Chromosome Fragmentation and Gynogenesis
Washington State Univ. Pullman, WA 99164	William Cheevers	$144,000	09/01/85	08/31/87	Structure, Organization and Expression of the CAE Virus Envelope Gene
Washington State Univ. Pullman, WA 99164	T. Yilma	$140,000	09/01/85	08/31/87	A General Method for the Production of Polyvalent Vaccines in Vaccinia Virus Recombinants
Washington State Univ. Pullman, WA 99164	Anthony Barbet	$95,900	09/01/85	08/31/87	Development of a Recombinant DNA Derived Vaccine against Bovine Anaplasmosis
Washington State Univ. Pullman, WA 99164	Raymond Reeves	$100,000	08/15/85	08/30/87	Cloning of Cellular Genes Responsive to Infection and Transformation by BLV

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL MOLECULAR BIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Children's Orthopedic Hospital & Medical Center 4800 Sand Point Way, NE Seattle, WA 98105	Stephen Moseley	$134,500	09/01/85	08/31/87	Genetic Organization and Function in the Production of the F41 Bacterial Adhesin
Univ. of Wisconsin Madison, WI 53706	Gary Splitter	$140,000	09/15/85	09/30/87	Characterization of the Bovine Major Histocompatibility Complex
Univ. of Wisconsin Madison, WI 53706	Richard Marsh	$145,000	09/01/85	08/31/87	Characterization of Scrapie Agent Nucleic Acid
	TOTAL	$4,381,000			

Biotechnology-Animal Growth and Development

Research in animal growth and development contributes to a basic understanding of potential problems related to suboptimal growth and development in animals of agricultural significance. This sub-program area emphasizes research designed to fill gaps in knowledge in a number of areas including mammary gland biogenesis and development, growth hormones and growth factors which regulate muscle and skeleton growth, the transfer of exogenous genes to the germline of domestic animals and their subsegment expression, the role of hormones and other factors in mediating immunologic stress, and developmental consequences of embryo transfers. Special attention is given to innovative projects of "high risk".

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Arizona Tucson, AZ 85721	Darrel E. Goll	$150,000	09/15/85	09/30/87	Proteases Responsible for Muscle Protein Degradation and Their Role in Growth
Univ. of California Davis, CA 95616	Ransom Baldwin	$185,000	09/15/85	09/30/87	Quantitative Evaluation of Physiological and Metabolic Limits to Lactation
Univ. of California Davis, CA 95616	Kirk C. Klasing	$100,000	09/15/85	09/30/87	Role and Mode of Action of Interleukin-1 in Mediating Immunologic Stress
Colorado State Univ. Ft. Collins, CO 80523	Rupert P. Amann	$101,300	09/15/85	09/30/87	Control of Prepubertal Changes in Neuroendocrine Function in Bull Calves
Univ. of Connecticut Storrs, CT 06268	Hans Laufer	$100,000	09/01/85	08/31/87	Control of Reproduction in Shrimp, Prawns and Crayfish
Univ. of Florida Gainesville, FL 32611	Francis C. Davis	$175,400	09/15/85	09/30/87	Translational Regulation of mRNAs Synthesized During Oogenesis

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Iowa State Univ. of Science & Technology Ames, IA 50011	C. M. Warner	$143,400	09/15/85	09/30/87	Role of the SLA Complex in Pig Development and Reproduction
Tufts Univ. Boston, MA 02111	V. Papaioannou	$122,000	09/15/85	09/30/87	Development and Viability of Micromanipulated Preimplantation Pig Embryos
Johns Hopkins Univ. Baltimore, MD 21205	John D. Gearhart	$150,000	09/15/85	09/30/87	Genetic and Developmental Consequences of Gene Transfer into Mouse Embryos
Univ. of Maryland College Park, MD 20742	Ian H. Mather	$90,700	09/01/85	08/31/89	Distribution and Biogenesis of Mammary Membrane Proteins
North Carolina State Univ. Raleigh, NC 27695	Ruth M. Shuman	$150,000	09/15/85	09/30/87	Gene Transfer and Tissue-specific Expression of Genes in Domestic Animals
Rutgers, The State Univ. Piscataway, NJ 08854	Rocco V. Carsia	$86,000	09/01/85	08/31/87	Molecular Biology of Stress Response at the Adrenocortical Cell Level

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Health Research, Inc. Roswell Park Division & New York State Dept. of Health 666 Elm Street Buffalo, NY 14263	Garth R. Anderson	$153,900	09/15/85	09/30/87	VL30 Sequences as Anoxic Stress Response Genes
Cornell Univ. Ithaca, NY 14853	David B. Wilson	$121,600	09/15/85	09/30/87	Genetic Engineering of Acid Resistant, Cellulolytic, Rumen Bacteria
Cornell Univ. Ithaca, NY 14853	Dale E. Bauman	$185,000	09/01/85	08/31/87	Cellular and Metabolic Mechanisms Controlling Efficiency of Growth and Lactation
Ohio Univ. Athens, OH 45701	T. E. Wagner	$150,000	09/15/85	09/30/87	Mammary Specific, Germline, Genetic Delivery of a Lactogenic Growth Hormone(s)
The Wistar Institute 36th & Spruce Streets Philadelphia, PA 19104	Davor Solter	$150,000	09/15/85	09/30/87	Cloning in Mammals by Nuclear Transfer
Pennsylvania State Univ. University Park, PA 16802	Terry D. Etherton	$100,000	09/15/85	09/30/87	Regulation of Nutrient Utilization in Pigs by Porcine Growth Hormone

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Pennsylvania State Univ. University Park, PA 16802	Craig Baumrucker	$100,000	09/15/85	09/30/87	IGF_1 Stimulation of Bovine Mammary Tissue Growth
Pennsylvania State Univ. University Park, PA 16802	Roy H. Hammerstedt	$100,000	09/01/85	08/31/87	Cryoprotection of Membranes
Pennsylvania State Univ. University Park, PA 16802	Frederick Ferguson	$100,000	09/15/85	09/30/87	Swine Natural Killer Cells: Cloning and Production of Monoclonal Antibodies
Texas A&M Res. Fdn. College Station, TX 77843	Thomas Welsh, Jr.	$100,000	09/01/85	08/31/87	Regulation of Corticotropin-releasing Factor (CRF) and Adrenocorticotropin (ACTH)
Univ. of Texas System Cancer Center M. D. Anderson Hospital and Tumor Institute Houston, TX 77030	Marsha L. Frazier	$150,000	09/15/85	09/30/87	Genes Coding for Insulin Immunoreactivity in Fetal Bovine Pancreas Development
Washington State Univ. Pullman, WA 99164	Lynette B. Corbeil	$124,200	09/15/85	09/30/87	Prevention of Stress Related Mastitis with Recombinant Bovine Interferon

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - ANIMAL GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Washington State Univ. Pullman, WA 99164-5045	Michael Griswold	$150,000	09/15/85	09/30/87	Bovine Testicular Transferrin
Univ. of Wisconsin Madison, WI 53706	Neal L. First	$161,500	09/15/85	09/30/87	Ontogeny and Control of Development of Bovine Preimplantation Embryos
	TOTAL	$3,400,000			

Biotechnology-Plant Growth and Development

The goal of this sub-program area is to support basic research designed to increase a fundamental understanding of the developmental processes in agriculturally important plants and plant associated microorganisms and to encourage the use of emerging techniques for the investigation of the developmental process that may contribute to the increased agricultural productivity. This program area places emphasis on; (1) cellular and molecular mechanisms controlling growth and developmental processes including reproduction, differentiation, and senescence, and (2) metabolic processes related to growth and development.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	AGREEMENT PERIOD TO	TITLE
Univ. of California Berkeley, CA 94720	Bob B. Buchanan	$105,000	08/01/85	07/31/87	Developmental Studies on Thioredoxin-linked Regulatory Mechanisms in C_4 Plants
Univ. of California Berkeley, CA 94720	William C. Taylor	$83,000	09/15/85	09/30/87	Chloroplast Development Influences Nuclear Gene Expression
Univ. of California Los Angeles, CA 90024	E. M. Tobin	$188,000	08/15/85	08/31/87	Functional and Mutational Analysis of a Thylakoid Protein
Univ. of Florida Gainesville, FL 32611	G. A. Moore	$118,000	08/01/85	07/31/87	Genetic Transformation of Citrus to Facilitate Hybrid Production
Agricultural Research Service, USDA P.O. Box 5677 Athens, GA 30613	Carole L. Bassett	$85,000	09/01/85	08/31/87	Characterization of RNases Synthesized during Floral Development in Morning Glory
Univ. of Chicago Chicago, IL 60637	Laurens J. Mets	$114,000	08/01/85	07/31/87	Genetic Control of Cellular Differentiation in Leaves of a C4 Dicot

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Illinois Chicago, IL 60680	C. W. Beecher	$50,000	08/15/85	08/31/87	Analysis of Secondary Metabolite Induction by NMR
Purdue Res. Fdn. West Lafayette, IN 47907	Brian A. Larkins	$130,000	09/01/85	08/31/87	Analysis of Seed Globulin Genes and their Expression in Cereals
Agricultural Research Service, USDA Rm. 227, Bldg. 003, BARC-West Beltsville, MD 20705	Jerry D. Cohen	$83,000	08/01/85	07/31/87	Characterization and Developmental Study of a Peptide Conjugate of IAA from *Phaseolus*
Michigan State Univ. East Lansing, MI 48824	Jan A. D. Zeevaart	$85,000	09/01/85	08/31/87	Genetic Control of Gibberellin Metabolism in Relation to Development in Tomato
Univ. of Minnesota St. Paul, MN 55104	Emily E. Hoover	$50,000	09/01/85	08/31/87	Regulation of Interspecific Seed Failure in *Phaseolus*
St. Mary's College Winona, MN 55987	Richard V. Knowles	$50,000	09/15/85	09/30/87	DNA Amplification in *Zea mays* Endosperm: Control and Relationship to Development

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Washington Univ. St. Louis MO 63130	Paul P-C. Lin	$64,000	08/01/85	07/31/87	Genetic/Molecular Biololgy and Regulation of Polyamine Metabolism
Washington Univ. St. Louis, MO 63130	John C. Rogers	$100,000	08/01/85	07/31/87	Mechanisms Directing Hormonal and Developmental Regulation of Gene Expression in Barley
Montana State Univ. Bozeman, MT 59717	Richard G. Stout	$50,000	09/01/85	08/31/87	Mode of Action of the Phytotoxin Fusicoccin: An Immunological Approach
Univ. of New Hampshire Durham, NH 03824	Thomas D. Lee	$67,000	08/15/85	08/31/87	Fruit and Seed Abortion: Are they Related to Pollen Competition?
The Rockefeller Univ. New York, NY 10021	Anthony Cashmore	$175,000	08/01/85	07/31/87	Genetic Manipulation of Protein Import into Plant Mitochondria
Oregon State Univ. Corvallis, OR 97331	Carol J. Rivin	$102,000	09/15/85	09/30/88	Molecular Analysis of Embryo Development in Wild Type and vp Mutants of Maize

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Oregon State Univ. Corvallis, OR 97331	Roy O. Morris	$165,000	08/01/85	07/31/87	Expression of Heterologous Cytokinin Biosynthetic Gene in Tobacco
Univ. of Oregon Eugene, OR 97403	Donald R. Hague	$103,000	09/01/85	08/31/87	Regulation of Pyruvate, Pi Dikinase in Maize
Gordon Research Conferences c/o Univ. of Rhode Island Gordon Research Center Kingston, RI 02881	Ronald L. Phillips	$6,000	06/01/85	11/30/85	Gordon Research Conference on Plant Cell and Tissue Culture
Texas A&M Res. Fdn. College Station, TX 77843	Craig L. Nessler	$85,000	07/15/85	07/31/87	Cell Specific Gene Expression during Laticifer Differentiation in Poppy
Univ. of Vermont & State Agric. College Burlington, VT 05405	Philip Lintilhac	$50,000	09/01/85	08/31/87	Developmental Patterning of Plant Callus Cultures with Mechanical Stimuli
Univ. of Washington Seattle, WA 98195	E. Van Volkenburgh	$67,000	09/15/85	09/30/87	Genetic Limitation of Leaf Growth

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT GROWTH & DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Wisconsin Madison, WI 53706	Chong-maw Cheng	$50,000	08/01/85	07/31/87	Molecular Control of Cytokinins on Plant Growth

TOTAL $2,225,000

Biotechnology-Genetic and Molecular Mechanisms Controlling Responses to Environmental Stress in Plants

This program supports research on the various physico-chemical factors (such as heat, cold, drought, etc.) which prevent the expression of the full genetic potential of a plant. The major goals are to understand the molecular basis for the response to the various stresses and to identify which genetic systems causing these responses can be manipulated by biotechnology techniques.

The program emphasizes: the identification, transfer, and expression of genes involved in the stress response or are likely to affect performance under stress; fundamental mechanisms of the stress response including injury, tolerance and avoidance of stress at the molecular, cellular, and organismal level; mechanisms of the coordination of organismal response to stress; and laboratory and field investigations leading to an understanding of the causes, consequences, and avoidance of stress.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - RESPONSE TO ENVIRONMENTAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Arizona Tucson, AZ 85721	Hans J. Bohnert	$141,000	08/01/85	07/31/87	Regulation of Gene Expression during CAM-Induction
Agricultural Research Service, USDA 800 Buchanan Street Albany, CA 94710	William J. Hurkman	$115,000	09/15/85	09/30/88	Identification of Membrane Proteins Responsible for Salt Tolerance
Univ. of California Davis, CA 95616	Carole P. Meredith	$110,000	09/15/85	09/30/87	Selection and Characterization of Mutants Resistant to Mineral Stress
Univ. of California Davis, CA 95616	M. A. Matthews	$144,000	08/01/85	07/31/87	Physiological Mechanisms of Plant Growth Inhibition by Low Water Potentials
Univ. of Florida Gainesville, FL 32611	Charles L. Guy	$119,000	09/01/85	08/31/88	Altered Gene Expression and Protein Synthesis in Spinach during Cold Acclimation
Iowa State Univ. Ames, IA 50011	Cecil R. Stewart	$101,000	08/01/85	07/31/87	Hormonal, Molecular, and Cellular Aspects of Stress Induced Proline Accumulation in Plants

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - RESPONSE TO ENVIRONMENTAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT FROM	PERIOD TO	TITLE
Purdue Res. Fdn. West Lafayette, IN 47907	Paul Hasegawa	$150,000	08/01/85	07/31/88	Role of Ion Accumulation and Compartmentation in Salinity Adaptation of Cultured Cells
Purdue Res. Fdn. West Lafayette, IN 47907	David Rhodes	$110,000	08/01/85	07/31/87	Metabolism of Proline Accumulation in Relation to Salinity Tolerance in Plants
Purdue Res. Fdn. West Lafayette, IN 47907	Peter Goldsbrough	$151,000	08/01/85	07/31/88	Regulation of Protein Synthesis Induced by Cadmium in Plant Cell Cultures
Univ. of Massachusetts Amherst, MA 01003	David L. Mulcahy	$30,000	09/01/85	08/31/86	Correlations Between Chilling Injuries in Soybean Sporophyte and Pollen
Michigan State Univ. East Lansing, MI 48824	Paul K. Kindel	$137,000	08/01/85	07/31/88	Structure-activity Relationships of the Freeze-inhibitor Polysaccharides of Winter Rye and Barley
Univ. of Minnesota St. Paul, MN 55104	John V. Carter	$33,000	09/15/85	09/30/86	Role of Microtubules in Freezing Injury and Cold Acclimation in Plants

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - RESPONSE TO ENVIRONMENTAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Minnesota St. Paul, MN 55108	Robert Brambl	$154,000	09/15/85	09/30/88	The Heat Shock (Stress) Response: Protein Function and Gene Regulation
Univ. of Nevada System on behalf of The Desert Research Institute P.O. Box 60220 Reno, NV 89506	Jeffrey Seemann	$89,000	09/01/85	08/31/87	Stress Effects on the Functioning and Efficiency of CO_2 Fixation
Cornell Univ. Ithaca, NY 14853	Peter L. Steponkus	$128,000	08/01/85	07/31/88	Cold Acclimation and Freezing Injury: Role of Plasma Membrane Lipid Alterations
Texas A&M Res. Fdn. College Station, TX 77843	John E. Mullet	$153,000	08/01/85	07/31/88	The Molecular Basis of Abscisic Acid Synthesis During Plant Water Stress
Univ. of Wisconsin Madison, WI 53706	Jiwan P. Palta	$135,000	09/01/85	08/31/87	Mechanism of Freezing Stress Resistance and Cold Acclimation in Plants

TOTAL $2,000,000

Biotechnology-Plant Response to Biological Stress

Grants in this area support studies on the genetic and molecular mechanisms controlling plant responses to other biological agents, such as insects, nematodes, fungi, bacteria, viruses, and mycoplasma-like organisms. A major goal of this sub-program area is to understand the molecular basis for the organism's interactions with these stress agents and to identify which genetic systems causing these responses can be manipulated by techniques in biotechnology.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Arizona Tucson, AZ 85721	Alan J. Howarth	$50,000	09/01/85	08/31/86	Transcription and Gene Expression of a Geminivirus
Univ. of California Berkeley, CA 94720	Loy E. Volkman	$150,000	08/15/85	08/31/88	AcNPV Structural Proteins
Univ. of California Berkeley, CA 94720	T. J. Morris	$100,000	09/01/85	08/31/87	Molecular Structure and Function of the Carnation of Mottle Virus Genome
Univ. of California Davis, CA 95616	Tsune Kosuge	$66,000	07/01/85	06/30/86	Control of Virulence in *Pseudomonas savastanoi*
Univ. of California Davis, CA 95616	George Bruening	$45,000	09/15/85	09/30/86	Molecular Basis of Symptom Induction by Cauliflower Mosaic Virus
Univ. of California Riverside, CA 92521	William O. Dawson	$100,000	09/01/85	08/31/87	Gene Expression of cDNA Clolnes of Tobacco Mosaic Virus
International Society for Plant Molecular Biology Athens, GA 30602	Leon Dure, III	$2,500*	09/01/85	02/28/86	First International Congress of Plant Molecular Biology

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Hawaii at Manoa Honolulu, HI 96822	John Leong	$130,000	09/15/85	09/30/87	Iron Uptake Genes of Plant Growth Promoting Pseudomonas
Univ. of Idaho Moscow, ID 83843	Lois K. Miller	$100,000	09/01/85	08/31/87	Improving the Efficacy of Baculovirus Pesticides by Recombinant DNA Technology
Univ. of Illinois Urbana, IL 61801	Judith H. Willis	$75,000	09/01/85	08/31/87	New Approaches for Obtaining Lepidopteran Epithelial Cell Lines
Purdue Res. Fdn. West Lafayette, IN 47907	Peter E. Dunn	$119,700	09/15/85	09/30/87	Structure and Expression of Genes Encoding Insect Antibacterial Proteins
Kansas State Univ. Manhattan, KS 66506	Steven A. Lommel	$50,000	09/15/85	09/30/86	Genetics, Replication and Pseudorecombination of the Dianthoviruses
Kansas State Univ. Manhattan, KS 66506	Jan E. Leach	$55,000	08/15/85	08/31/86	Avirulence in the Rice/Xanthomonas Campestris pv. Oryzae Interaction

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Agricultural Research Service, USDA Room 227, Bldg. 003 BARC-West Beltsville, MD 20705	Jacobus M. Kaper	$130,000	09/15/85	09/30/87	Cucumovirual Satellites: Structure - Biological Function
Agricultural Research Service, USDA Room 227, Bldg. 003 BARC-West Beltsville, MD 20705	Robert A. Owens	$120,000	08/15/85	08/31/88	Mechanisms of Plant Viroid Replication and Viroid-host Interaction
Agricultural Research Service ARS, USDA Room 227, Bldg. 003, BARC-West Beltsville, MD 20705	C. J. Baker	$90,000	09/01/85	08/31/87	The Molecular and Genetic Basis for Disease Resistance in Plants
Univ. of Maryland College Park, MD 20742	Alan Collmer	$100,000	09/15/85	09/30/87	Mechanism of Pectate Lyase Excretion by *Erwinia chrysanthemi*
North Carolina State Univ. Raleigh, NC 27695	William Dougherty	$150,000	09/01/85	08/31/87	Molecular Analysis of Potyvirus Capsid Protein; Role in Aphid Transmission

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Medicine & Dentistry of New Jersey-School of Osteopathic Medicine 401 Haddon Ave. Camden, NJ 08103	Ann M. Fallon	$100,000	09/01/85	08/31/87	Application of DNA-mediated Gene Transfer to Studies on Insecticide Resistance
Cornell Univ. Ithaca, NY 14853	Milton Zaitlin	$100,000	09/01/85	08/31/87	Interactions of Plant Viruses with Their Hosts
The Rockefeller Univ. New York, NY 10021	Hugh D. Robertson	$120,000	08/15/85	08/31/87	Viroid Multiplication and Disease Induction
Ohio State Univ. Res. Fdn. Columbus, OH 43212	David L. Coplin	$100,000	09/01/85	08/31/87	Genes for Exopolysaccharide Biosynthesis and Virulence in _Erwinia stewartii_
Oregon State Univ. Corvallis, OR 97331	Wallice I. Mills	$120,000	09/01/85	08/31/87	Isolation of _Pseudomonas_ Gene Products that Cause Disease in _Phaseolus vulgaris_
Oregon State Univ. Corvallis, OR 97331	George F. Rohrmann	$100,000	09/01/85	08/31/87	Identification and Characterization of Baculovirus Gene Translation Products

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Oregon Eugene, OR 97403	John Poltlethwait	$150,000	09/01/85	08/31/87	Molecular Genetics of Immunity in Fruit Flies
Texas A&M Res. Fdn. College Station, TX 77843	Max D. Summers	$160,000	09/15/85	09/30/87	Integration of *Campoletis sonorensis* Virus DNA in Parasitoid Wasp Cellular DNA
Utah State Univ. Logan, UT 84322	Anne J. Anderson	$55,900	09/15/85	09/30/87	Molecular Events in Elicitor-Plant Cell Interaction
Utah State Univ. Logan, UT 84322	Neal K. Van Alfen	$60,900	09/15/85	09/30/86	Investigation of a Cytoplasmic Virulence Regulatory Locus in *Endothia Parasitica*
Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061	George H. Lacy	$150,000	09/15/85	09/30/87	Genetic Dissection of Pathogenicity in *Erwinia carotovora*
Washington State Univ. Pullman, WA 99164	Clarence A. Ryan	$150,000	09/01/85	08/31/87	Isolation and Transformation of a Wound-Induced Trypsin Inhibitor Gene from Alfalfa

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: BIOTECHNOLOGY - PLANT RESPONSE TO BIOLOGICAL STRESS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Washington Seattle, WA 98195	Lynn M. Riddiford	$100,000	08/15/85	08/31/87	Molecular Analysis of Eclosion Hormone in the Tobacco Hornworm, *Manduca sexta*

TOTAL $3,100,000

* Total award amount of $10,000 was split-funded with Plant Molecular Biology contributing the initial $7,500.

ACID PRECIPITATION

This program supports research on the effects of acid precipitation on economically important plants including trees and associated microorganisms. Specific areas encouraged are: interactive effects of acidic rain with other atmospheric pollutants; effect of excess hydrogen ions and oxides of nitrogen and sulfur on heavy metal mobilization and on other soil processes; predisposition of plants exposed to acid to secondary effects e.g. pathogens; and the mechanisms of the response to acid deposition.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ACID PRECIPITATION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of California Riverside, CA 92521	Robert Musselman	$65,000	09/15/85	09/30/86	Effects of Acidic Fog on Agricultural Crops in California
Yale Univ. New Haven, CT 06520	William Smith	$106,605	08/01/85	07/31/88	Rhizosphere Regulation of Heavy Metal Uptake by Forest Trees
Univ. of Illinois Urbana, IL 61801	Donald Dolske	$70,000	09/01/85	08/31/86	A Field Study of Dry Deposition of Airborne Materials to Soybeans and Corn
Univ. of Illinois Urbana, IL 61801	Wayne Banwart	$118,000	09/01/85	08/31/87	Differential Cultivar Response to Acidic Precipitation
Univ. of Minnesota St. Paul, MN 55104	Edward Sucoff	$48,000	09/15/85	03/31/87	Al in the Soil Solution of the Rhizosphere: Effected on Root Viability in Pine and Oak
North Carolina State University Raleigh, NC 27695	Denis DuBay	$85,000	09/15/85	09/30/87	The Effects of Atmospheric Pollutants on the Reproduction of Agricultural Crops

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ACID PRECIPITATION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Rutgers, The State University New Brunswick, NJ 08903	Gene Hall	$30,000	09/15/85	09/30/87	Element Analysis of Precisely-dated Tree Rings to Study Causes of Growth Decline
Columbia Univ. New York, NY 10027	Gordon Jacoby, Jr.	$22,111	09/15/85	09/30/87	Element Analysis of Precisely-dated Tree Rings to Study Causes of Growth Decline
Ohio State Univ. Res. Fdn. Columbus, OH 43212	James McClenahen	$52,200	09/01/85	08/31/88	Acidic Deposition Histories Using Multi-elemental Tree-ring Analysis
Ohio State Univ. Res. Fdn. Columbus, OH 43212	Benjamin Stinner	$26,738	09/01/85	08/31/86	Effects of Acid Precipitation on Arthropod Fauna in Conservation Tilled Corn Systems
Northeastern Forest Expt. Station Forest Service, USDA Broomall, PA 19008	Keith Jensen	$43,755	09/01/85	02/28/87	Impact of Ozone and Aluminum on Pitch Pine and Yellow Poplar Seedling Growth
	TOTAL	$667,409			

ANIMAL SCIENCE

The emphasis in this research program is to improve reproductive efficiency in domestic farm animals. Research is supported in all possible problem areas: puberty, ovulation, corpus luteum formation and function, sperm physiology, insemination, fertilization, prenatal death, and poor survival of offspring. There are two sub-programs:

Brucellosis. This sub-program area supports research at the cellular, molecular, and genetic levels to define the mechanisms by which *Brucella abortus* induces disease in cattle and to define the basis of the bovine interactive response with *B. abortus* that results in protective immunity. Proposals are also encouraged which through molecular biological analyses, identify and produce (a) antigens to differentiate non-infected, vaccinated, and the *B. abortus*-infected cattle, and (b) immunogens to stimulate long-lived protective immunity in cattle.

Reproductive Physiology. This sub-program area supports innovative research in the following categories: (a) Mechanisms affecting embryo survival, endocrinological control of embryo development, mechanisms of embryo-maternal interactions, and embryo implantation; (b) gamete physiology, primarily gametogenesis including maturation processes, follicle growth, ovulation, corpus luteum formation and function and superovulation; fundamental processes of fertilization mechanisms regulating gamete survival *in vivo* and *in vitro*, and basic questions regarding gamete transport and (c) fundamental questions addressing parturition, postpartum interval to conception and neonatal survival.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - REPRODUCTIVE EFFICIENCY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of California Davis, CA 95616	Jerry L. Hedrick	$382,000	09/15/85	09/30/88	Fertilization in the Pig
Univ. of Georgia Res. Fdn. Athens, GA 30602	Terry Kiser	$130,000	09/15/85	09/30/88	Opiate Regulation of Luteinizing Hormone in the Postpartum Anestrous Beef Cow
Iowa State Univ. of Science & Technology Ames, IA 50011	Lloyd L. Anderson	$100,750	09/15/85	09/30/88	Regulation of Relaxin and Progesterone Secretion by Aging Porcine Corpora Lutea
Univ. of Illinois Urbana, IL 61801	Janice M. Bahr	$175,000	09/15/85	09/30/88	Effect of Age on Reproductive Efficiency of the Domestic Hen
Purdue Res. Fdn. West Lafayette, IN 47907	P. V. Malven	$199,000	09/01/85	08/31/88	Involvement of Endogenous Opioids in the Postpartum Inhibition of LH
Univ. of Minnesota St. Paul, MN 55104	M. E. El Halawani	$181,000	09/15/85	09/30/88	Modulation of Reproductive Efficiency by Prolactin in Domestic Turkey

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - REPRODUCTIVE EFFICIENCY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Missouri Columbia, MO 65211	B. N. Day	$139,000	09/01/85	08/31/87	Effect of Intrauterine Position on Subsequent Reproduction and Behavior in Swine
North Carolina State Univ. Raleigh, NC 27695	Jack H. Britt	$245,000	09/01/85	08/31/88	Control of Ovarian Folicular Development in the Pig
Univ. of Nevada Reno, NV 89557	Duane L. Garner	$222,000	09/01/85	08/31/88	Automated Assessment of Bovine Sperm Fertilizing Potential
Cornell Univ. Ithaca, NY 14853	Robert Corradino	$321,000	09/01/85	08/31/88	The Role of Calcium in Bovine Corpus Luteum Function
Ohio State Univ. Res. Fdn. Columbus, OH 43210	William F. Pope	$140,000	09/15/85	09/30/88	Estrogenic Alteration of Uterine Activity Affecting Embryo Survival in Swine
Texas A&M Res. Fdn. College Station, TX 77843	David W. Forrest	$34,000	09/15/85	09/30/86	Endocrine Control of Bioactive Luteinizing Hormone during Sexual Maturation

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - REPRODUCTIVE EFFICIENCY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Washington State Univ. Pullman, WA 99164	Lynette B. Corbeil	$132,000	09/01/85	08/31/88	Suboptimal Bovine Reproductive Efficiency: Trichomoniasis
	TOTAL	$2,400,750			

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - BRUCELLOSIS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Agricultural Research Service, USDA P.O. Box 70 RR #2 Ames, IA 50010	L. B. Tabatabai	$171,000	09/01/85	08/31/88	Recombinant Brucella Proteins for Vaccines and Diagnostic Reagents
Cornell Univ. Ithaca, NY 14853	Alexander Winter	$149,000	09/15/85	09/30/87	Protection Induced in Rats to _Brucella_ _abortus_ by Viable and Nonviable Vaccines
Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061	Gerhardt Schurig	$160,150	09/01/85	08/31/88	Cloning of _B._ _Abortus_ Antigens Involved in Protective Immunity
	TOTAL	$480,150			

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - REPRODUCTIVE PHYSIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	AGREEMENT PERIOD TO	TITLE
Univ. of California Davis, CA 95616	Thomas E. Adams	$173,000	09/01/85	08/31/88	Endocrine Control of Ovulation in Sheep Actively Immunized Against GnRH
Univ. of Florida Gainesville, FL 32610	Peter J. Hansen	$225,000	09/15/85	09/30/88	The Function of Proteins Secreted by the Periattachment Bovine Conceptus
Kansas State Univ. Manhattan, KS 66506	D. L. Davis	$207,800	09/[illegible]1/85	08/31/88	Embryonic Signals in Pregnancy Establishment in the Pig
Cornell Univ. Ithaca, NY 14853	Douglas F. Antczak	$209,800	09/01/85	08/31/88	Invasive Trophoblast in the Genus Equus
Pennsylvania State Univ. University Park, PA 16802	Gary J. Killian	$215,850	09/01/85	08/31/88	Bovine Oviductal Fluid Biochemistry and its Relationship to Gamete Physiology
Agric. Expt. Station Univ. of Tennessee Knoxville, TN 37901	James D. Godkin	$220,000	09/15/85	09/30/88	Bovine Fetal-Maternal Interactions

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL SCIENCE - REPRODUCTIVE PHYSIOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Wisconsin Madison, WI 53706	Linda A. Schuler	$92,000	09/15/85	09/30/87	Synthesis and Characterization of Recombinant DNA-produced Bovine Placental Lactogen
Univ. of Wisconsin Madison, WI 53706	Roy L. Ax	$97,000	09/15/85	09/30/87	Characteristics of Glycosaminoglycan Binding Sites in Ovarian Follicles of Cows

TOTAL $1,440,450

ALCOHOL RESEARCH

This program is administered under the authority of Section 1419 of Public Law 95-113, as amended, which authorizes grants for research in areas of alcohols and industrial hydrocarbons from agricultural commodities and forest products and agricultural chemicals and other products and coal derivates. The total amount available for this program during Fiscal Year 1985 was $518,562.

The Alcohol program funds are intended to stimulate and support energy-related research. This includes research on the evaluation (including economic), treatment, and conversion of biomass for manufacture of alcohol. Such research is national in scope, is not designed to meet the needs or address the problems of a particular State, area or locality, does not include demonstration or pilot research projects, and does not involve capital construction. Eligible institutions include colleges, universities, Government corporations and Federal laboratories. A list of the research grants awarded in Fiscal Year 1985 follows.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ALCOHOL FUELS RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Purdue Res. Fdn. West Lafayette, IN 47907	Nancy W. Y. Ho	$60,000	09/01/85	08/31/87	Improvement of Yeast Alcohol Fermentation via Genetic Engineering
Univ. of Massachusetts Amherst, MA 01003	E. Canale-Parola	$82,583	09/01/85	08/31/87	Cellulases and Hemicellulases of Ethanol-producing Mesophilic Bacteria
North Carolina State Univ. Raleigh, NC 27695	Leo W. Parks	$95,489	08/01/85	07/31/87	Cell Membrane Technology in the Fermentative Production of Alcohol
Agric. Expt. Station Cook College Rutgers Univ. New Brunswick, NJ 08903	Douglas Eveleigh	$103,000	09/01/85	08/31/87	Alcohol Fuel from Zymomonas: Genetic Approaches to Enhance its use of Biomass
Cornell Univ. Ithaca, NY 14853	Robert K. Finn	$77,500	09/01/85	08/31/87	Novel Bacterial Route for Fermenting Agricultural Residues to Alcohol

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: ALCOHOL FUELS RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Lehigh Univ. Bethlehem, PA 18015	B. S. Montenecourt	$99,990	08/01/85	07/31/87	Formation of Interspecies Hybrids of Solvent-producing Clostridia
	TOTAL	$518,562			

INSECT PEST SCIENCE

Before successful strategies for managing insect pests can be developed, a strong basic insect biology research effort is needed. The Insect Pest Science Program provided $960,300 each for basic studies on boll weevil/bollworm, pine bark beetles, and gypsy moth. This program area supports research on behavioral physiology; chemical ecology; insect-host interaction; endocrinology; population dynamics; behavioral ecology; and insect pathogens, parasites and predators.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: INSECT PEST SCIENCE - BOLL WEEVIL/BOLLWORM

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Univ. of Arizona Tucson, AZ 85721	William S. Bowers	$80,000	09/15/85	09/30/87	Regulation of Insecticide Transport and Metabolism by Hemolymph Proteins in the Bollworm
Univ. of California Davis, CA 95616	Bruce D. Hammock	$168,000	09/01/85	08/31/88	Affinity Purified JH Esterase and Its Gene for Bollworm Control
Agricultural Research Service, USDA P.O. Box 70, RR #2 Ames, IA 50010	Thomas A. Coudron	$124,500	09/01/85	08/31/88	Enzymatic Action in the Mode of Entry of Nomuraea rileyi into Heliothis Larvae
Univ. of Kentucky Res. Fdn. Lexington, KY 40506-0057	Douglas L. Dahlman	$80,000	09/01/85	08/31/87	Endocrinology of Heliothis-Parasite Interactions
Mississippi Agric. & For. Expt. Stn. Mississippi State Univ. Mississippi State, MS 39762	Sonny B. Ramaswamy	$77,800	08/01/85	07/31/87	Sensory Receptors and Cues for Oviposition by heliothis (Noctuidae)

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: INSECT PEST SCIENCE - BOLL WEEVIL/BOLLWORM

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Agricultural Research Service, USDA P.O. Box 225 Stoneville, MS 38776	J. E. Powell	$100,000	09/15/85	09/30/87	Monitoring Parasitism of *Heliothis* *spp*. with *Microplitis croceipes* Sex Pheromone
Agricultural Research Service, USDA P.O. Box 225 Stoneville, MS 38776	Keith R. Hopper	$90,000	09/01/85	08/31/87	Effect of *Heliothis* Abundance on Control by Parasitic Wasps
North Carolina State Univ. Raleigh, NC 27695-7003	Fred L. Gould	$120,000	09/01/85	08/31/88	Assessing the Genetic Potential of *Heliothis* spp. to Adapt to Resistant Crop Varieties
Texas A&M Res. Fdn. College Station, TX 77843	J. R. Cate	$120,000	09/15/85	09/30/87	Ecology, Host Relationships and Biosystematics of the Boll Weevil
	TOTAL	$960,300			

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PEST SCIENCE - GYPSY MOTHS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Kentucky Res. Fdn. Lexington, KY 40506	Thomas W. Kimmerer	$70,000	09/01/85	08/31/87	Role of Host Volatiles in Interaction Between Agrilus Bilineatus and Oaks
Univ. of Massachusetts Amherst, MA 01003	Joseph S. Elkinton	$180,000	09/01/85	08/31/88	Effect of Vertebrate Predation on Gypsy Moth Population Dynamics
Univ. of Massachusetts Amherst, MA 01003	Ring T. Carde	$245,000	08/01/85	07/31/88	Orientation of Flying Gypsy Moths to Pheromone
Res. Fdn. of State Univ. of New York Albany, NY 12201	Glenn D. Prestwich	$251,000	09/15/85	09/30/88	Pheromone Biochemistry of Gypsy Moths
Univ. of Oregon Eugene, OR 97403	George C. Carroll	$42,000	08/01/85	07/31/86	Fungal Egg-parasites of the Gypsy Moth: A Significant Cause of Egg Mortality?
Northeastern Forest Expt. Station Forest Service, USDA 370 Reed Road Broomall, PA 19008	Thomas M. Odell	$72,300	09/01/85	08/31/87	Genetic Markers for Identifying Gypsy Moth Populations

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: PEST SCIENCE - GYPSY MOTHS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Pennsylvania State Univ. University Park, PA 16802	J. C. Schultz	$100,000	09/01/85	08/31/87	Impact of Food Quality and Gut Physiology on Gypsy Moth Susceptibility to a Baculovirus
	TOTAL	$960,300			

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COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: INSECT PEST SCIENCE - PINE BARK BETTLE

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Arkansas Fayetteville, AR 72701	F. M. Stephen	$87,310	09/15/85	09/30/87	Host Resistance/Suitability: Mechanisms and Impact on Dendroctonus Populations
Univ. of California Berkeley, CA 94720	David L. Wood	$271,600	09/01/85	08/31/88	Bark Beetles as Indicators of and Contributors to Stress in Pondorosa Pine
Univ. of Florida Gainesville, FL 32611	James L. Nation	$104,060	09/01/85	08/31/87	Chemical Ecology of the Black Turpentine Beetle, Dendroctonus terebrans
Univ. of Georgia Res. Fdn. Athens, GA 30602	C. Wayne Berisford	$197,330	09/01/85	08/31/88	Evaluation of Regional Differences in Aggregating Pheromones of the Southern Pine Bark Beetle
North Carolina State Univ. Raleigh, NC 27695	Fred P. Hain	$120,000	09/15/85	09/30/87	Host Resistance of Southern Yellow Pines to Bark Beetle Attack
Texas A&M Res. Fdn. College Station, TX 77843	Thomas L. Payne	$80,000	09/01/85	08/31/87	Sensory Basis of Interspecific Olfactory Communication in Southern Pine Bark Beetle Complex

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: INSECT PEST SCIENCE - PINE BARK BETTLE

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Brigham Young Univ. Provo, UT 84602	Rex G. Cates	$100,000	09/15/85	09/30/87	Host Resistance/Suitability: Mechanisms and Impact on Dendroctonus Populations
	TOTAL	$960,300			

SOYBEAN RESEARCH PROGRAM

The overall goal of this program area is to support long-term, basic biological research on soybeans that can generate new ideas, new knowledge, and innovative technologies which ultimately will contribute to increased productivity of the soybean crop. Interdisciplinary approaches are encouraged. This program area emphasizes research projects that are designed to: (1) enhance the fundamental understanding of physiology and biochemistry of the soybean, and (2) develop innovative genetic and breeding strategies for enhanced soybean germplasm.

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: SOYBEAN RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Georgia Res. Fdn. Athens, GA 30602	R. S. Hussey	$61,589	09/15/85	09/30/87	Quantification of Soybean Cyst Nematode Damage to Soybean Root Systems for Integration into Crop
Univ. of North. Iowa Cedar Falls, IA 50614	Virginia S. Berg	$53,577	09/15/85	09/30/87	Leaf Orientation, Water Stress and Photosynthesis in Soybeans
Purdue Res. Fdn. West Lafayette, IN 47907	April C. Mason	$85,000	09/15/85	09/30/87	Characterization of the Form of Selenium in Soybean
Agric. Expt. Station Univ. of Kentucky Lexington, KY 40546	Dennis B. Egli	$83,750	09/15/85	09/30/89	The Genotype x Environment Interaction for the Duration of Seed Fill in Soybeans
Agric. Expt. Station Univ. of Kentucky Lexington, KY 40546	Todd W. Pfeiffer	$51,519	09/15/85	09/30/87	Genetic Variation for Recombination Levels in Soybean
Univ. of Minnesota St. Paul, MN 55104	William A. Brun	$62,000	09/15/85	09/30/87	Soybean Seed Growth Responses to Intermittent Water Stress

COMPETITIVE RESEARCH GRANTS PROGRAM
PROGRAM AREA: SOYBEAN RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Missouri Columbia, MO 65211	Virgil D. Luedders	$100,000	09/15/85	09/30/87	Genetics of the Cyst Nematode-Soybean Association
	TOTAL	$497,435			

FOREST AND RANGELAND RENEWABLE RESOURCES PROGRAM

This is a new entry in the Competitive Research Grants Program (CRGO). It was established by Congress as special funding to the U.S. Department of Agriculture Forest Service Research. However, the funds were transferred to the neutral ground of CRGO so Forest Service scientists could also compete. When appropriating the funds, Congress stipulated that they were to be equally divided between harvesting, processing, and utilization research; and forest biology, including biotechnology. Based on Congressional intent, together with research needs identified by the forestry community, each half of the program developed its special areas of emphasis. This program is administered under the authority of Section 5 of P.L. 95-307, 16 U.S.C. 1644.

The Wood Utilization part focused on three areas: (1) Wood Chemistry and Biochemistry where breakthroughs have unlimited potential for expanding wood utilization. Basic questions needing attention include the principles governing enzymatic reactions affecting bioconversion and deterioration mechanisms, lignin and cellulose polymer modification, surface chemistry, bonding chemistry, and thermal reactions. (2) Physical/Mechanical Properties of Wood and Basic Processing Technology, which constitutes an area needing an improved base of scientific knowledge for development of new products and processes. This research is concentrated on anatomical structures, physical and mechanical properties, and processing characteristics of both solid and reconstituted wood materials. (3) Improvements in the area of Structural Wood Engineering have long been hampered by reliance on traditional methods and a lack of technical data on the performance of wood under in-service conditions. The aim here is to encourage innovational approaches to the structural use of wood, and to gain better knowledge of interactions within a structure, develop improved reliability based designs, and increased understanding of basic failure mechanisms.

The Forest Biology part emphasizes two areas: (1) Genetic Structure and Function, which is aimed at utilizating variations and adaptations that exist in gene pools of existing populations. Research focus is on development of better techniques for genetic engineering, production on whole plants from tissue or cell culture, identification of valuable genes, and increased knowledge of genomes. (2) The objectives of Mechanisms of Interactions in Forest Systems are to gain a basic understanding of the forces that influence forest ecosystems, especially their development and productivity. Research is needed in this area that leads to increased basic knowledge of the mechanisms driving and synergistic processes, and those involved in antagonistic relationships of forest organisms.

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Arizona Tucson, AZ 85721	Frank W. Telewski	$85,234	09/15/85	09/30/87	Response of Pinus taeda Ecotypes to Wind and Drought: Implication for Early Genetic Evaluation
Pacific Southwest Forest & Range Expt. Station Forest Service, USDA 1960 Addison Street, P.O. Box 245 Berkeley, CA 94701	R. R. Sederoff	$184,050	09/15/85	09/30/88	A DNA Transfer System for Pine
Pacific Southwest Forest & Range Expt. Station Forest Service, USDA 1960 Addison Street, P.O. Box 245 Berkeley, CA 94701	David B. Wagner	$140,108	09/15/85	09/30/88	Genetic Interactions between Chloroplast and Nuclear Genomes in a Hybrid Zone
Univ. of California Berkeley, CA 94720	Richard S. Dodd	$129,456	09/15/85	09/30/89	Biological Mechanisms of Patterned Variation in Wood Structure in Douglas Fir
Pacific Southwest Forest & Range Expt. Station Forest Service, USDA 1960 Addison Street, P.O. Box 245 Berkeley, CA 94701	F. Thomas Ledig	$44,098	09/15/85	12/31/85	A Workshop in Forest Biotechnology

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of California Davis, CA 95616	Alison M. Berry	$174,753	09/15/85	09/30/88	Cytology and Physiology of Early Nodulation Events in the *Frankia-Alnus* Symbiosis
Colorado State Univ. Ft. Collins, CO 80523	C. P. P. Reid	$187,180	09/15/85	09/30/88	Carbon Use in Mycorrhizae Symbiosis: Carbon Allocation/Phosphorus Nutrition in Pine
Univ. of Georgia Res. Fdn. Athens, GA 30602	Harry E. Sommer	$93,956	09/15/85	09/30/87	Cloning of Forest Trees by Somatic Embryogenesis
Purdue Res. Fdn. West Lafayette, IN 47907	Nancy W. Y. Ho	$122,015	09/15/85	09/30/87	Development of Technology for Efficient Utilization of Xylose
Univ. of Kentucky Res. Fdn. Lexington, KY 40546	Louis Shain	$181,949	09/15/85	09/30/90	Mechanisms of Host-pathogen Interaction Between *Castanea*, *Quercus* and *Endothia parasitica*
Louisiana State Univ. & A&M College Baton Rouge, LA 70803	G. B. Williamson	$176,779	09/15/85	09/30/88	Mechanisms of Allelopathy in Pine Forests of the Southeastern Coastal Plain

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT FROM	PERIOD TO	TITLE
Southern Forest Experiment Station Forest Service, USDA U.S. Postal Svs. Bldg., Rm T-10210, 701 Loyola Ave. New Orleans, LA 70113	Richard Hemingway	$177,909	09/15/85	09/30/88	Condensed Tannins as Substitutes for Resorcinol in Cold-Setting Phenolic Resins
Southern Forest Expt. Station Forest Service, USDA U.S. Postal Svs. Bldg., Rm T-10210, 701 Loyola Ave. New Orleans, LA 70113	Charles McMillin	$127,616	09/15/85	09/30/88	A Computer Vision System for Non-Destructively Locating Defects in Lumber
Harvard College Cambridge, MA 02139	John G. Torrey	$125,394	09/15/85	09/30/87	Cell-Wall Degrading Enzymes in Early Infection of Symbiotic Nitrogen-Fixing Trees
Univ. of Maryland College Park, MD 20742	M. C. Ma	$147,663	09/15/85	09/30/88	*In vitro* and *In vivo* Studies of Gypsy Moth Nuclear Polyhedrosis Virus with Hybridoma Antibodies
Univ. of Maine Orono, ME 04469	Michael Greenwood	$131,725	09/15/85	09/30/87	Gene Expression During Maturation in Conifers in Relation to Application of Biotechnology
Univ. of Maine Orono, ME 04469	Barry S. Goodell	$182,830	09/15/85	09/30/87	Enzymatic Wood Degradation by Hymenomycetous Decay Fungi

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Maine Orono, ME 04469	Michael Bentley	$146,246	09/15/85	09/30/87	Birchbark as a Source of Semisynthetic Antifeedants for Agricultural Insect Control
Michigan State Univ. East Lansing, MI 48824	Dennis Fulbright	$175,000	09/15/85	09/30/88	Hypovirulence: A Mechanism to Regulate _Endothia_ _parasitica_ in Forest Ecosystem
Michigan State Univ. East Lansing, MI 48824	James W. Hanover	$161,126	09/15/85	09/30/88	Genetic Structure and Adaptation of Natural Populations of Spruce
Michigan Technological Univ. Houghton, MI 49931	D. F. Karnosky	$82,327	09/15/85	09/30/87	Genetic Engineering with _Larix_ Species
Michigan Technological Univ. Houghton, MI 49931	Peter E. Laks	$121,656	09/15/85	09/30/88	Copper Containing Wood Preservatives from Conifer Bark Tannins
Univ. of Minnesota St. Paul, MN 55104	Wesley P. Hackett	$141,738	09/15/85	09/30/88	Selection of Somaclonal Variants for Resistance to _Septoria_ _Musiva_ in _Populus_

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Minnesota St. Paul, MN 55104	John Grant	$131,920	09/15/85	09/30/86	Rheology, Drying and Biodegradation of Compacted Wood-Chip Fuels
MS Agric. & Forestry Expt. Station Mississippi State Univ. Mississippi State, MS 39762	J. D. Hodges	$100,826	09/15/85	09/30/87	Southern Pine Beetle-Microorganism-Host Interactions: Role of the Fungi in Host Mortality
Southeastern Forest Experiment Station Forest Service, USDA 200 Weaver Boulevard Asheville, NC 28804	Gene NamKoong	$116,474	09/15/85	09/30/88	Genetic Analysis of Forest Ecosystems
Southeastern Forest Experiment Station Forest Service, USDA 200 Weaver Boulevard Asheville, NC 28804	H. R. Powers, Jr.	$131,327	09/15/85	09/30/87	Biotechnological Studies on Pathotypes of the Fusiform Rust Fungus
Res. Fdn. of State Univ. of New York Albany, NY 12201	Wilfred A. Cote	$132,479	09/15/85	09/30/88	The Initiation and Propagation of Failure in Wood

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Oregon State Univ. Corvallis, OR 97331	Michael Newton	$138,948	09/15/85	09/30/89	Competitive Interactions among Western Hemlock, Red Alder, and Riparian Salmonberry
Oregon State Univ. Corvallis, OR 97331	Joseph Karchesy	$153,583	09/15/85	09/31/88	Structures and Reactions of Polymeric Flavanoids from Whole Bark of Douglas-fir
Oregon State Univ. Corvallis, OR 97331	Roy O. Morris	$189,825	09/15/85	09/30/88	Developing a Method for Gene Insertion on Gymnosperms
Oregon State Univ. Corvallis, OR 97331	Philip E. Humphrey	$148,871	09/15/85	09/30/88	Pressing Wood-Based Composites: Modelling to Optimise Design and Manufacture
Pacific Northwest Forest & Range Expt. Station Forest Service, USDA P.O. Box 3890 Portland, OR 97208	B T. Bormann	$120,108	09/15/85	09/30/88	Soil Development and Decomposition: Effects of Forest Productivity in SE Alaska
Northeastern Forest Experiment Station Forest Service, USDA 370 Reed Road Broomall, PA 19008	Philip M. Wargo	$176,217	09/15/85	09/30/88	Interaction of Armillaria, Stress and Site Disturbance in Mortality in Deciduous Forests

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Pennsylvania State Univ. University Park, PA 16802	Ming Tien	$165,000	09/15/85	09/30/88	Selection of Lignin-degrading Mutants of *Phanerochaete chrysosporium*
Clemson Univ. Clemson, SC 29631	Donald D. Hook	$187,000	09/15/85	09/30/87	Intraspecific Variation and Physiology of Loblolly Pine to Waterlogged Soils
Texas A&M Res. Fdn. Box 3578 College Station, TX 77843	Donald A. Bender	$150,000	09/15/85	09/30/88	Statistical Characterization of Lumber for Glued-Laminated Beams
Utah State Univ. Logan, UT 84322	James N. Long	$140,234	09/15/85	09/30/88	Ecosystem Development: The Relation between Leaf Area, Structure, and Production
Intermountain Forest & Range Expt. Station Forest Service, USDA 324 25th Street Ogden, UT 84401	Roland L. Barger	$175,000	09/15/85	09/30/88	Characterizing North American Lodgepole Pine as an Industrial Raw Material
Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061	Thomas E. McLain	$88,964	09/15/85	09/30/88	Prediction of Failure Stress in Notched Wood Beams

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061	Frederick A. Kamke	$100,121	09/15/85	09/30/88	Viscoelastic Behavior of the Wood-Adhesive System During Flakeboard Manufacture
Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061	Norman G. Lewis	$171,307	09/15/85	09/30/88	The Structure and (Bio)-conversion of Lignin in Intact Plants: A New Approach
Univ. of Washington Seattle, WA 98195	Milton P. Gordon	$230,338	09/15/85	09/30/87	Genetic Engineering of Poplars
Univ. of Washington Seattle, WA 98195	Kyosti Sarkanen	$100,000	09/15/85	09/30/88	Characterization and Modification of Native and Isolated Lignins
Univ. of Washington Seattle, WA 98195	William T. McKean	$58,022	09/15/85	09/30/87	Pulping Solutions Transport
Weyerhaeuser Company Tacoma, WA 98477	Francis C. Beall	$125,700	09/15/85	09/30/89	Analysis of Glueline Curing Using Ultrasonic Techniques

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Forest Products Laboratory Forest Service, USDA P.O. Box 5130 Madison, WI 53705	Richard A. Horn	$46,280	09/15/85	09/30/89	Optimizing Design of Linerboard for Greater Compressive Strength by Press Drying
Forest Products Laboratory Forest Service, USDA P.O. Box 5130 Madison, WI 53705	Thomas J. Urbanik	$112,984	09/15/85	09/30/89	Computer-Aided Design of Unitized Corrugated Containers for the Shipping Environment
Forest Products Laboratory Forest Service, USDA P.O. Box 5130 Madison, WI 53705	Charles Gerhards	$160,000	09/15/85	09/30/89	Effect of Temperature and Relative Humidity on Duration of Load of Lumber
Univ. of Wisconsin Madison, WI 53706	C. G. Hill, Jr.	$175,000	09/15/85	09/30/89	Saccharification Rates Vary with Cellulosic Substrates. Can they be Predicted?
Univ. of Wisconsin Madison, WI 53706	Raymond A. Young	$175,000	09/15/85	09/30/89	Chemical Fractionation of Wood to Polymers and Fibers by Solvent and Derivative Techniques

FOREST & RANGELAND RENEWABLE RESOURCES PROGRAM

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Forest Products Laboratory Forest Service, USDA P.O. Box 5130 Madison, WI 53705	Anton TenWolde	$25,000	09/15/85	09/30/87	Modeling Attic Humidity as a Function of Weather, Building Construction, and Ventilation Rates
Forest Products Laboratory Forest Service, USDA P.O. Box 5130 Madison, WI 53705	George E. Myers	$186,416	09/15/85	09/30/89	Resin Curing and Bonding in Flakeboard Made by Steam-Injection Pressing
Univ. of Wisconsin Madison, WI 53706	Robert E. Rowlands	$175,000	09/15/85	09/30/88	Strength Behavior of Bolted Wood Connections
	TOTAL	$7,528,752			

SPECIAL RESEARCH GRANTS PROGRAM

The objective of this grant program is to carry out research to facilitate or expand promising breakthroughs in areas of food and agricultural sciences of importance to the Nation. Two major areas of research were funded under this program during Fiscal Year 1985:

Animal Health Research	$5,761,800
Aquaculture Research	497,435
TOTAL	$6,259,235

This program is administered under the authority of Section 2(c) (1) of P.L. 89-106, as amended. Eligible institutions include land-grant colleges and universities, State agricultural experiment stations, and all colleges and universities having a demonstrable capacity in food and agricultural research.

A brief description of each of the two areas of research in the Special Research Grants Program follows with a listing of research grants awarded in each for FY 1985.

Animal Health

Overall, this research is to develop and/or refine abiotic and biotic methods to suppress animal losses from infectious and noninfectious diseases and internal and external parasites. The research is directed toward clarifying infectious and noninfectious diseases and parasites and their interactive effects on animal health; and to develop practical and implementable management systems for the producer to prevent or alleviate these causes of animal losses.

Research includes clarification of complex or unknown etiologies, development or improvement of diagnostic methodologies, clarification of disease pathogenesis and methods of transmission, studies of resistance mechanisms and resistance-enhancing factors and development of disease prevention, control or eradication technologies.

Research is centered on highest priority animal health problems of beef and dairy cattle, swine, poultry, sheep and goats, horses and aquaculture species as identified by the Animal Health Science Research Advisory Board. This includes studies on major causes of disease losses in beef and dairy cattle production such as the respiratory disease complex, reproductive diseases including brucellosis and anestrus, enteric and digestive diseases, mastitis, bluetongue, parasites and metabolic diseases. Research on swine centers on health hazards such as enteric, reproductive and respiratory diseases, and other major problems such as pseudorabies and trichinosis. Poultry disease studies include respiratory diseases, skeletal problems, enteric, neoplastic and immunologic disorders. Sheep research includes diseases such as food rot, respiratory diseases, parasites and bluetongue. Equine health research centers on respiratory, enteric and reproductive diseases and musculo-skeletal disorders. Research on diseases in aquaculture species also is included.

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Auburn Univ. Auburn University, AL 36849	Byron L. Blagburn	$68,432	09/01/85	08/31/87	Avian *Cryptosporidium*: Pathogenicity, Specificity and Interactions with other Agents
Auburn Univ. Auburn University, AL 36849	J. A. Plumb	$13,179*	09/01/85	02/29/88	Relationship of Dietary Folic Acid and Pteroic Acid Anemia of Catfish
Univ. of California Davis, CA 95616	Ronald Hedrick	$76,129	08/01/85	07/31/87	Proliferative Kidney Disease (PKD) of Salmonid Fish
Colorado State Univ. Ft. Collins, CO 80523	G. E. Seidel, Jr.	$66,047	09/01/85	08/31/86	Cryopreservation of Bovine Embryos in Chemically Defined Media
Colorado State Univ. Ft. Collins, CO 80523	B. J. Beaty	$148,381	09/01/83	08/31/87	Nucleic Acid Hybridization Probes: Diagnosis of Bovine Viral Reproductive Disease
Univ. of Connecticut Storrs, CT 06268	John L. Augustine	$147,031	09/01/85	08/31/88	Phaseous Lymphadenitis in Small Ruminants
Univ. of Connecticut Storrs, CT 06268	Harland Renshaw	$149,765	09/15/85	09/30/88	Identification and Characterization of *P. haemolytica* Protective Antigens

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Florida Gainesville, FL 32611	Guy H.Palmer	$50,131	09/15/85	09/30/87	Development of a Subunit Diagnostic Test for Bovine Anaplasmosis
Univ. of Georgia Res. Fdn. Athens, GA 30602	W. L. Ragland, III	$114,454	07/01/85	06/30/88	Induction of Precocious Immunity with Avian Thymic Hormone
Iowa State Univ. of Science & Technology Ames, IA 50011	James A. Roth	$149,748	07/01/85	06/30/87	Activation of Neutrophils to Enhance Resistance to Bovine Respiratory Disease
Iowa State Univ. of Science & Technology Ames, IA 50011	James A. Roth	$97,302	07/01/85	06/30/88	Molecular Aspects of the Interactions of Brucella abortus and Bovine Neutrophils
Iowa State Univ. of Science & Technology Ames, IA 50011	M. J. Wannemuehler	$62,899	09/15/85	09/30/88	Biologic Significance of Endotoxin to the Pathogenesis of Swine Dysentery
Iowa State Univ. of Science & Technology Ames, IA 50011	Henry M. Stahr	$58,006	08/01/84	07/31/86	Detoxification of Trichothecene Mycotoxins for Swine

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Illinois Champaigne, IL 61820	William Wagner	$149,935	09/01/85	08/31/88	Placental Hormone Synthesis and Retained Placenta in Dairy Cattle
Univ. of Illinois Urbana, IL 61801	John A. Shadduck	$100,000	09/01/85	08/31/88	Intracellular Signaling and Modulation of Bovine Mammary Leukocytes and Endothelium
Univ. of Illinois Urbana, IL 61801	David A. Stahl	$143,854	09/01/85	08/31/88	A Molecular Phylogeny of Mycobacteria Directed to Johne's Disease Diagnosis
Agric. Expt. Station Univ. of Kentucky Lexington, KY 40546	George P. Allen	$105,000	09/01/85	08/31/88	Antigenic Characterization of the Major Glycoproteins of Equine Herpesvirus-1
Louisiana State Univ. & A&M College Baton Rouge, LA 70803	R. E. Corstvet	$112,373	08/01/85	07/31/88	Effect *in Vivo* of Components of *Pasteurella haemolytica* on Bovine Lung Disease
Michigan State Univ. East Lansing, MI 48824	R. F. Slocombe	$146,714	09/15/85	09/30/88	Neutrophil-mediated Mechanisms of Lung Damage in Bovine Pneumonic Pasteurellosis

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Michigan State Univ. East Lansing, MI 48824	Martha H. Mulks	$148,966	08/01/85	07/31/87	Immunobiology and Pathogenesis of Hemophilus pleuropneumoniae Infection in Swine
Univ. of Minnesota St. Paul, MN 55104	Kevin A. Janni	$70,000	08/01/85	07/31/88	Turkey Respiration System Response to Spores After Exposure to Ammonia and Dust
Univ. of Minnesota St. Paul, MN 55104	T. W. Molitor	$131,389	07/01/85	06/30/88	Porcine Parvovirus, Pathogenicity, and Persistence in Swine
Univ. of Minnesota St. Paul, MN 55104	S. K. Maheswaran	$112,374	07/15/85	07/31/88	In Vivo Investigations on Potential Pathogenic Factors of P. haemolytica
Univ. of Minnesota St. Paul, MN 55104	S. M. Goyal	$57,787	07/01/85	06/30/87	The Concentration of Avian Influenza Virus from Water and the Environment
Univ. of Minnesota St. Paul, MN 55104	H. S. Joo	$118,650	07/01/85	06/30/88	Seroepidemiology and Control of Pseudorabies in Swine

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Montana State Univ. Bozeman, MT 59717	Clarence Speer	$97,235	09/15/85	09/30/88	Bovine Coccidiosis: Antigen Analysis and Immunization
NC Agriculture Research Service North Carolina State Univ. Raleigh, NC 27695	E. V. De Buysscher	$138,404	08/01/85	07/31/88	Cloning and Expression of Newcastle Disease Virus Surface Proteins
Agric. Expt. Station North Dakota State Univ. Fargo, ND 58105	Daniel L. Rock	$149,841	08/01/85	07/31/88	Molecular Analysis of Latent Infection with Bovine Herpesvirus Type 1 (BHV-1)
Univ. of North Dakota Grand Forks, ND 58202	Stephen K. Wikel	$100,000	09/01/85	08/31/88	Acquired and Induced Tick Resistance: Antigen Analysis and Isolation
Agric. Expt. Station Univ. of Nebraska Lincoln, NE 68588	S. Srikumaran	$149,269	09/01/85	08/31/88	Lymphokine Regulation of Antibody Production in Bovine Respiratory Infections
Ohio State Univ. Res. Fdn. Columbus, OH 43212	Yehia M. Saif	$74,230	09/01/85	08/31/87	Viral Enteritis of Turkeys and Chickens: The Role of Astro-like Viruses

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Ohio State Univ. Res. Fdn. Columbus, OH 43212	Kenneth Smith	$70,915	07/15/85	07/31/87	Pathogenesis of Coliform Bacteria in the Nonlactating Bovine Mammary Gland
Ohio State Univ. Columbus, OH 43212	K. W. Theil	$90,550	09/01/85	08/31/88	Improved Methods for Detecting Porcine Rotavirus-like Virus Infections
Ohio State Univ. Res. Fdn. Columbus, OH 43212	Linda J. Saif	$149,996	09/01/85	08/31/88	Pathogenesis of Coronavirus Infections and Passive Immunity in Calves
Oklahoma State Univ. Stillwater, OK 74078	M. J. Gentry	$150,000	07/01/85	06/30/88	*P. haemolytica* cytotoxin: Molecular Studies of Pathogenesis and Immunogenicity
Oregon State Univ. Corvallis, OR 97331	Jeffrey Barlough	$90,000	07/15/85	07/31/87	Pathogenesis of Tillamook Calicivirus Infection in Calves
Univ. of Pennsylvania Philadelphia, PA 19104	Benjamin Wolf	$90,465	07/15/85	07/31/88	Rapid Immunoisoelectric Focusing Test for Avian Influenza and Newcastle Disease Viruses

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Pennsylvania State Univ. University Park, PA 16802	F. G. Ferguson	$148,421	09/15/85	09/30/88	Piglet Respiratory and Enteric Cellular Immune Responses to Pseudorabies Virus
Pennsylvania State Univ. University Park, PA 16802	Richard A. Wilson	$134,360	09/01/85	08/31/87	Functions of Mammary Gland Lymphocytes and Effects of Dry Gland Secretions
Medical Univ. of South Carolina 171 Ashley Ave. Charleston, SC 29425	Eric R. James	$29,511	09/15/85	03/31/87	Cryoreservation of Trichinella
South Dakota State Univ. Brookings, SD 57007	David A. Benfield	$68,007	09/15/85	09/30/87	Role of Cellular Receptors in the Pathogenesis of Porcine Enteric Viral Infections
Agric. Expt. Station Univ. of Tennessee P.O. Box 1071 Knoxville, TN 37901	L. N. D. Potgieter	$149,418	09/15/85	09/30/88	Cloning and Hybridization Probes in Pathogenesis Studies

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD		TITLE
			FROM	TO	
Agric. Expt. Station Univ. of Tennessee Knoxville, TN 37901	David A. Brian	$150,000	09/15/85	09/30/88	Development of Potential Enteric Coronavirus Vaccine Sources Using Recombinant DNA
Texas A&M Res. Fdn. College Station, TX 77843	J. Templeton	$136,331	09/01/85	08/31/87	Genetic Control of Macrophage Function in Bovine Brucellosis
Baylor College of Medicine Houston, TX 77030	Marc H. Dresden	$123,826	09/01/85	08/31/87	Biochemical and Immunological Studies of Infection by *Strongyloides ransomi*
Virginia Polytechnic Inst. & State Unv. Blacksburg, VA 24061	Craig Hammerberg	$76,489	08/01/85	07/31/88	Immunomodulating Factor(s) Produced by a Porcine Lymphoblastoid Cell Line
Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061	Yasuko Rikihisa	$73,040	09/01/85	08/31/86	Pathogenic Mechanisms and Immune Response in Potomac Horse Fever
Washington State Univ. Pullman, WA 99164	R. G. Breeze	$57,000	09/01/83	08/31/87	Subunit and Synthetic Peptide Vaccines and Rapid Diagnostic Kits for Vesicular Diseases

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Washington State Univ. Pullman, WA 99164	Bruce A. Watkins	$99,539	09/15/85	09/30/87	Control of Abnormal Lipid Metabolism Observed during Fatty Liver and Kidney Syndrome and Sudden Death Syndrome in Broiler Chicks
Washington State Univ. Pullman, WA 99164	Tilahun Yilma	$139,303	09/01/85	08/31/87	A Polyvalent Vaccinia Virus Recombinant Vaccine for Bluetongue
Washington State Univ. Pullman, WA 99164	Lynette Corbeil	$149,984	09/01/85	08/31/88	A Subunit Vaccine for Trichomoniasis
Washington State Univ. Pullman, WA 99164	James A. Magnuson	$93,640	09/01/85	08/31/88	Development of a Vaccine to Escherichia coli Heat-stable Enterotoxin
Univ. of Wisconsin Madison, WI 53706	Kevin T. Schultz	$120,316	09/15/85	08/31/87	A Bluetongue Anti-Idiotype Vaccine

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: ANIMAL HEALTH RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Wisconsin Madison, WI 53706	Ronald D. Schultz	$63,164	09/15/85	09/30/86	Liposome Antibiotic Activated Phagocytes to Treat and/or Prevent Mastitis

TOTAL $5,761,800

* Total award amount of $76,912 was split-funded with Aquaculture Research contributing the initial $63,733.

Aquaculture

The purpose of this program area is to provide and/or improve upon the scientific and technical base needed by the aquaculture industry. This industry has been expanding rapidly. Problems of nutrition, breeding, physiology, management, disease and parasite control are important and are becoming more limiting as the size of the industry and its concentration have increased.

Interest is focused on local and regional problems for which solutions will contribute to national objectives related to aquaculture production.

The specific objectives of the research are: (1) improved production efficiency through diet formulation, reproduction and breeding, and disease and parasite control; (2) improved water quality for production and control of factors affecting the quality of water discharge; and (3) increased production of freshwater species having high production potential such as catfish, trout, bait minnows, and crawfish.

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: AQUACULTURE RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Auburn Univ. Auburn University, AL 36849	R. T. Lovell	$49,698	09/01/85	08/31/87	Ascorbic Acid and Disease Resistance in Channel Catfish
Auburn Univ. Auburn University, AL 36849	J. A. Plumb	$63,733*	09/01/85	02/29/88	Relationship of Dietary Folic Acid and Pteroic Acid to Anemia of Catfish
Univ. of Georgia Res. Fdn. Athens, GA 30602	Emmett Shotts, Jr.	$80,000	09/01/85	08/31/87	Protozoan Interaction in Bacterial Fish Diseases
Purdue Res. Fdn. West Lafayette, IN 47907	Charles Chrisman	$56,238	09/01/85	08/31/87	Hybridization and Polyploidization of Catfish for Improved Performance
Agric. & Forestry Expt. Station Mississippi State Univ. P.O. Drawer ES Mississippi State, MS 39762	John A. Boyle	$59,548	09/15/85	09/15/87	Nucleic Acid Probes as Diagnostic Tools in Channel Catfish
Univ. of Oklahoma Norman, OK 73019	William L. Shelton	$48,555	08/15/83	08/31/87	Comparative Efficacy of Two Gonodotropic Agents to Induce Ovulation in Paddlefish

SPECIAL RESEARCH GRANTS PROGRAM
PROGRAM AREA: AQUACULTURE RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Oregon State Univ. Corvallis, OR 97331	John S. Rohovec	$60,690	09/15/85	09/30/88	Development of an Effective Vaccine Against _Aeromonas salmonicida_
Univ. of Washington Seattle, WA 98195	Walton W. Dickhoff	$78,973	09/01/85	04/30/87	Atlantic Salmon Net-pen Farming: Techniques for Efficient Broodstock Rearing
	TOTAL	$497,435			

* Total award amount of $76,912 was split-funded with Animal Health Research contributing the remaining $13,179.

RANGELAND RESEARCH GRANTS

Rangeland Grants are awarded to support basic research in certain areas of rangeland research such as (1) Management of rangelands and agricultural land as integrated systems for more efficient utilization of crops and waste products in the production of food and fiber, (2) methods of managing rangeland watersheds to maximize efficient use of water and improve water yield, water quality and water conservation to protect against onsite and offsite damage of rangeland resources from floods, erosion and other detrimental influences, and to remedy unsatisfactory and unstable rangeland conditions, and (3) revegetation and rehabilitation of rangeland including the control of undesirable species of plants.

COOPERATIVE STATE RESEARCH SERVICE
PROGRAM AREA: RANGELAND RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Univ. of Arizona Tucson, AZ 85721	James Klemmedson	$78,688	08/15/85	08/14/90	Soil Fertility Factors Controlling Secondary Succession on Subalpine Ranges of Utah
Agric. Expt. Station Univ. of Nebraska Lincoln, NE 68583	Terry Klopfenstein	$78,728	08/15/85	02/29/88	Optimum Use of Rangeland, Pasture and Crop Residues in Beef Production Systems
Oregon State Univ. Corvallis, OR 97331	J. A. Moore	$79,540	08/15/85	02/29/88	Evaluating the Water Quality Impacts of Six Rangeland Management Systems
Agric. Expt. Station Texas A&M Univ. College Station, TX 77843	Wilbert Blackburn	$50,000	09/01/85	08/31/87	Vegetation Management for Improved Water Use Efficiency and Water Yield on Texas Rangelands
Utah State Univ. Logan, UT 84322	Neil E. West	$79,998	08/15/85	08/31/88	Some Responses of Soil Microphytic Crusts to Livestock Trampling
Utah State Univ. Logan, UT 84322	Frederick Provenza	$50,000	09/01/85	08/31/88	Diet Training Management: A New Approach to Increasing Rangeland and Livestock Production

COOPERATIVE STATE RESEARCH SERVICE
PROGRAM AREA: RANGELAND RESEARCH

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Utah State Univ. Logan, UT 84322	Edith B. Allen	$63,196	08/15/85	08/31/87	Interactions of Range Grasses, Weeds, and VA Mycorrhizae: Carbon Balance and Competition
	TOTAL	$480,150			

SMALL BUSINESS INNOVATION RESEARCH PROGRAM

The objectives of this program are to stimulate technological innovation in the private sector, to strengthen the role of small business in meeting Federal research and development needs, to increase private sector commercialization and development efforts, and to encourage participation of small and disadvantaged firms in technological innovation.

The program emphasizes support of high-quality research and development proposals containing advanced concepts related to important agricultural problems and opportunities that could lead to significant public benefits. The areas considered in this program are broad and encompass a wide range of agricultural sciences. The subtopics include: (1) air, water and soils, (2) animal production and protection, (3) food science and nutrition, (4) forests and related resources, (5) plant production and protection, and (6) rural and community development.

In Fiscal Year 1985, USDA awarded both Phase I and Phase II grants. Phase I grants are primarily for research designed to determine technical feasibility of the proposed approach or concept. Phase II grants are awarded to those Phase I projects that have shown sufficient promise for further support. The total amount awarded in Fiscal Year 1985 was $3,150,946.

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: AIR, WATER & SOILS

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Agricultural Electronics Corporation 4020 East Coronado Drive Tucson, AZ 85718	William Gensler	$49,912	09/15/85	03/31/86	An Active Electrochemical Instrument System for Determination of Water Stress
Kamterter, Inc. P.O. Box 30327 Lincoln, NE 68503	John A. Eastin	$200,000	09/15/85	09/30/87	Facilitating the Colonization of Plant Roots by Beneficial Microorganisms
R&A Plant/Soil, Inc. 24 Pasco - Kahlotus Road Pasco, WA 99301	Blaine Metting	$49,596	09/15/85	03/31/86	Palmelloid Microalgae as Soil-conditioning Agents
	TOTAL	$299,508			

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: ANIMAL PRODUCTION & PROTECTION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Memory Metals, Inc. 84 West Park Place Stamford, CT 06901	James Stice	$46,720	09/15/85	03/31/86	Natural Ventilation Management of Livestock Buildings using Shape Memory Alloys
Prime-Color, Inc. 8 Knight Road Wayne, NJ 07470	W. A. Thornton	$43,167	09/15/85	03/31/86	Lamplight Designed Specifically to Ease USDA Meat-Inspection
Bionique Laboratories, Inc. Bloomingdale Road Saranac Lake, NY 12983	Steven J. Geary	$49,974	09/15/85	03/31/86	Improved DNA Probe for the Rapid Detection of *Mycoplasma gallisepticum*
Lee Scientific, Inc. 379 N. University, #102 Provo, UT 84601	Douglas Later	$49,996	09/15/85	03/31/86	Supercritical Fluid Extraction and Analysis of Residues in Meats
	TOTAL	$189,857			

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: FOOD SCIENCE & NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	AGREEMENT PERIOD TO	TITLE
Hemogenetics, Inc. P.O. Box 5459 Berkeley, CA 94705	G. P. Der-Balian	$50,000	09/15/85	03/31/86	Salmonella Measurement with Bioluminescent Immunoassay
IDETEK, Inc 1057 Sneath Lane San Bruno, CA 94066	Prithipal Singh	$45,000	09/15/85	03/31/86	A Non-Instrumented Immunoassay for Aflatoxin B_1
ST&E Technical Services, Inc. 20 Belinda Court San Ramon, CA 94583	Stanley Klainer	$40,000	09/15/85	03/31/86	Unique Measurement of Nutrients Fluxes Using Fiber Optics
Hawaii Biotechnology Group, Inc. 99-193 Aiea Heights Drive Aiea, HI 96701	Douglas C. Vann	$200,000	09/01/85	08/31/87	Rapid Detection of Carbamate Pesticides in Food and Environmental Samples
Lembeck Associates, Inc. 7900 College Boulevard Overland Park, KS 66210	Henry G. Lembeck	$48,709	09/15/85	03/31/86	Containerized Bulk Export Shipment of Wheat Flour and Other Powder and Granular Food Products

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: FOOD SCIENCE & NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Universal Sensors, Inc. P.O. Box 736 New Orleans, LA 70148	Glenn Luprano	$40,625	09/15/85	03/31/86	Rapid, Novel Methods for Determining Total Protein, Protein Quality, and Sucrose
Innovative Tehcnology, Inc. Box 10072, Southern Station Hattiesburg, MS 39406	Willard Douglas	$50,000	09/01/84	08/31/86	Development of Dry Film Assay for the Rapid Detection of Trichinosis in Swine
American Research Corporation of Virginia P.O. Box 3406 Radford, VA 24143	Russell Churchill	$249,000	09/15/85	09/30/87	Laser Diagnostics of Microbial Populations in Food Processing Systems
	TOTAL	$723,334			

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: FOREST & RELATED RESOURCES

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Engineering Data Management, Inc. P.O. Box 1774 Ft. Collins, CO 80522	G. Brent Fagan	$195,000	09/01/85	08/31/87	Reliable Strength Assessment of Wood Composites Using Non-destructive Evaluation Techniques
Woodland Services, Inc. Box 257 Moose Lake, MN 55767	David L. Eggen	$50,000	09/15/85	03/31/86	Integration of Mechanical and Chemical Forest Site Preparation Techniques
Mater Engineering, Ltd. P.O. Box O Corvallis, OR 97339	M. Scott Mater	$47,520	09/15/85	03/31/86	Lumber Yield Value Optimization through Market-responsive Log Yard Management
National Gypsy Moth Management Group, Inc. R. D. #1, Box 715 Landisburg, PA 17040	Mark Ticehurst	$34,776	09/15/85	03/31/86	Reducing Cost and Improving Effectiveness of Gypsy Moth Parasites in IPM
Efficient Machinery Company 220 - 111th Avenue, S.E. Bellevue, WA 98004	Peter Hammerschlag	$250,000	09/15/85	09/30/87	Systematic Analysis of Central Passage Circular Sawing Processing

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: FOREST & RELATED RESOURCES

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
AMINEX Company P.O. Box 4174 Federal Way, WA 98063	Robert Arsenault	$45,970	09/15/85	03/31/86	Stress Wave Analysis of Wood Piles Related to Ultimate Compressive Strength
	TOTAL	$623,266			

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: PLANT PRODUCTION & PROTECTION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Plant Genetics, Inc. 1930 Fifth Street Davis, CA 95616	M. K. Redenbaugh	\$47,880	09/15/85	03/31/86	Artificial Seeds: Encapsulation of Somatic Embryos
ST&E Technical Sevices, Inc. 20 Belinda Court San Ramon, CA 94583	Stanley Klainer	\$40,000	09/15/85	03/31/86	Fiber Optic Chemical Sensors for In-Situ O_2, CO_2, and H_2O Measurements During Photosynthesis
Citrex Technologies, Inc. 728 NW Avenue Gainesville, FL 32602	John D. Cox	\$49,815	09/15/85	03/31/86	The Use of X-rays to Disinfest Grapefruit of Carib Fly within the Packinghouse
Photics, Inc. 98 Old Lowell Road Westford, MA 01886	Rudolph Bradbury	\$230,000	09/15/85	09/30/87	Holographic Sunlight Distribution for High Efficiency Greenhouses
Bio-Metric Systems, Inc. 9932 West 74th Street Eden Prairie, MN 55344	Patrick E. Guire	\$249,000	09/15/85	09/30/87	Enzyme Immunoassay Technology and Fieldable Assay Kits for Plant Pathogens

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: PLANT PRODUCTION & PROTECTION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
Hunt Farms 4021 Italy Hill Road Branchport, NY 14418	Derek J. Wilber	$129,000	09/15/85	09/30/87	Management of Field Grafted Grapevines in Cold Climate Vineyards
Decagon Devices, Inc. NW 800 Fisk Pullman, WA 99163	Grant A. Harris	$33,295	09/15/85	03/31/86	A Rapid Method of Quantifying Root Area and Length
	TOTAL	$778,990			

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: RURAL & COMMUNITY DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
SRM Corporation 2653 West 32nd Avenue Denver, CO 80211	James A. Kent	$49,500	09/15/85	03/31/86	A New Method for Efficient Mapping of Human Geographical Boundaries in Rural Areas
DUAL-Comm, Inc. Suite 1250, 1015 Fifteenth St., N.W. Washington, DC 20005	John C. Beresford	$249,000	09/15/85	09/30/87	Local Area Leading Indicators
Associated Enterprise Development, Inc. 120 Admiral Cochrane Drive Annapolis, MD 21401	Leonard Blackshear	$44,895	09/15/85	03/31/86	Aiding Rural Governments and Institutions through Voice Messaging Technology
Incubator Technologies, Inc. Twitty Park-Research Drive, Route 4, Box 519 Rolla, MD 65401	F. Terry Nixon	$100,000	09/01/84	08/31/86	Development of the High-tech Incubator Concept for a Rural/University Setting

SMALL BUSINESS INNOVATION RESEARCH PROGRAM
PROGRAM AREA: RURAL & COMMUNITY DEVELOPMENT

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	TITLE
American Forest Mushroom Association, Inc. P.O. Box 1362 Asheville, NC 28802	Toby J. Farris	$49,860	09/15/85	03/31/86	Inoculation Techniques for Forest Mushroom (L. edodes) Production
E. P. Systems Group, Inc. 332 West Fairmont Avenue State College, PA 16801	Eugene J. Bazan	$42,736	09/15/85	03/31/86	The Feasibility of a Manual for Rural Economic Developers
	TOTAL	$535,991			

FOOD AND AGRICULTURAL SCIENCES NATIONAL NEEDS GRADUATE FELLOWSHIPS GRANT PROGRAM

This program was initiated because of increasing concern about growing shortages of trained professionals in the food and agricultural sciences. The objective of the program is to encourage outstanding students (U.S. citizens) to pursue and complete a graduate degree in an area of the food and agricultural sciences for which there is a national need for the development of scientific expertise. The Fiscal Year 1985 program consisted of grants to colleges and universities with superior graduate teaching and research programs in the targeted areas of the food and agricultural sciences. Fellowships were awarded in the following areas in Fiscal Year 1985 as renewals to those institutions receiving 1984 awards.

Agricultural Engineering	$ 991,818
Biotechnology	1,487,029
Food and Agricultural Marketing	1,186,898
Food Science/Human Nutrition	1,184,255
	$4,850,000

This program is administered under the authority of Section 1417(a) (3) (B) of P.L. 95-113, as amended (7 U.S.C. 3103). Eligible institutions include all U.S. colleges and universities which confer a Master's or doctoral degree in an area of the food and agricultural sciences targeted for national needs fellowships.

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIP SUPPORTED
Univ. of Arizona Tucson, AZ 85721	William G. Matlock	$7,534	09/15/84	03/31/88	1 Master's
Univ. of Arizona Tucson, AZ 85721	William G. Matlock	$5,016	09/15/84	03/31/88	1 Master's
Colorado State Univ. Ft. Collins, CO 80523	D. B. McWhorter	$40,902	09/15/84	03/31/88	6 Doctoral
Colorado State Univ. Ft. Collins, CO 80523	D. B. McWhorter	$63,884	09/15/84	03/31/88	6 Doctoral
Univ. of Florida Gainesville, FL 32611	D. E. Buffington	$38,404	09/15/84	03/31/88	4 Doctoral
Univ. of Florida Gainesville, FL 32611	J. W. Mishoe	$27,268	09/15/84	03/31/88	4 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIP SUPPORTED
Univ. of Hawaii at Manoa Honolulu, HI 96822	D. Singh	$6,535	09/15/84	03/31/88	1 Master's
Univ. of Hawaii at Manoa Honolulu, HI 96822	D. Singh	$5,016	09/15/84	03/31/88	1 Master's
Purdue Res. Fdn. West Lafayette, IN 47907	Edwin J. Monke	$27,268	09/15/84	03/31/88	4 Doctoral
Purdue Res. Fdn. West Lafayette, IN 47907	Edwin J. Monke	$42,707	09/15/84	03/31/88	4 Doctoral
Iowa State Univ. of Science & Technology Ames, IA 50011	T. A. Austin	$68,170	09/15/84	03/31/88	10 Doctoral
Iowa State Univ. of Science & Technology Ames, IA 50011	T. A. Austin	$96,010	09/15/84	03/31/88	10 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIP SUPPORTED
Univ. of Maryland College Park, MD 20742	Fred W. Wheaton	$44,117	09/15/84	03/31/88	2 Master's, 5 Doctoral
Univ. of Maryland College Park, MD 20742	Fred W. Wheaton	$60,809	09/15/84	03/31/88	2 Master's, 5 Doctoral
Univ. of Nebraska Lincoln, NE 68588	William Splinter	$40,902	09/15/84	03/31/88	6 Doctoral
Univ. of Nebraska Lincoln, NE 68588	William Splinter	$59,182	09/15/84	03/31/88	6 Doctoral
North Carolina State Univ. Raleigh, NC 27695	R. W. Skaggs	$38,404	09/15/84	03/31/88	4 Doctoral
North Carolina State Univ. Raleigh, NC 27695	R. W. Skaggs	$27,268	09/15/84	03/31/88	4 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIP SUPPORTED
Ohio State Univ. Columbus, OH 43212	Warren L. Roller	$5,016	09/15/84	03/31/88	1 Master's
Ohio State Univ. Research Foundation Columbus, OH 43212	Warren L. Roller	$6,402	09/15/84	03/31/88	1 Master's
Oklahoma State Univ. Stillwater, OK 74078	Gerald Brusewitz	$57,606	09/15/84	03/31/88	6 Doctoral
Oklahoma State Univ. Stillwater, OK 74078	Gerald Brusewitz	$40,902	09/15/84	03/31/88	6 Doctoral
Oregon State Univ. Corvallis, OR 97331	Richard H. Cuenca	$21,240	09/15/84	03/31/88	3 Master's
Oregon State Univ. Corvallis, OR 97331	Richard H. Cuenca	$15,048	09/15/84	03/31/88	3 Master's

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Clemson Univ. Clemson, SC 29631	James T. Ligon	$6,817	09/15/84	03/31/88	1 Doctoral
Clemson Univ. Clemson, SC 29631	James T. Ligon	$9,601	09/15/84	03/31/88	1 Doctoral
South Dakota State Univ. Brookings, SD 57007	Mylo A. Hellickson	$25,608	09/15/84	03/31/88	4 Master's
South Dakota State Univ. Brookings, SD 57007	Mylo A. Hellickson	$20,064	09/15/84	03/31/88	4 Master's
Texas A&M Univ. College Station, TX 77843	Edward A. Hiler	$33,341	09/15/84	03/31/88	5 Doctoral
Texas A&M Univ. College Station, TX 77843	Edward A. Hiler	$48,749	09/15/84	03/31/88	5 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: AGRICULTURAL ENGINEERING

GRANTS AWARDED FOR FISCAL YEAR 1984

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIP SUPPORTED
Virginia Polytechnic Inst. & State Univ. Blacksburg,VA 24061	C. G. Haugh	$25,608	09/15/84	03/31/88	4 Master's
Virginia Polytechnic Inst. & State Univ. Blacksburg, VA 24061	C. G. Haugh	$20,064	09/15/84	03/31/88	4 Master's
Univ. of Wyoming Laramie, WY 82071	J. L. Smith	$20,064	09/15/84	03/31/88	4 Master's
Univ. of Wyoming Laramie, WY 82071	J. L. Smith	$32,302	09/15/84	03/31/88	4 Master's

TOTAL $1,087,828

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Univ. of California Berkeley, CA 94720	Russell L. Jones	$34,085	09/15/84	03/31/88	5 Doctoral
Univ. of California Berkeley, CA 94720	Russell L. Jones	$48,005	09/15/84	03/31/88	5 Doctoral
Univ. of California Los Angeles, CA 90024	J. P. Thornber	$34,757	09/15/84	03/31/88	5 Doctoral
Univ. of California Los Angeles, CA 90024	J. P. Thornber	$49,847	09/15/84	03/31/88	5 Doctoral
Univ. of California Riverside, CA 92521	John V. Leary	$76,808	09/15/84	03/31/88	8 Doctoral
Univ. of California Riverside, CA 92521	John V. Leary	$54,536	09/15/84	03/31/88	8 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Stanford Univ. Stanford, CA 94305	Harold A. Mooney	$62,339	09/15/84	03/31/88	6 Doctoral
Stanford Univ. Stanford, CA 94305	Harold A. Mooney	$24,484	09/15/84	03/31/88	5 Doctoral
Colorado State Univ. Ft. Collins, CO 80523	Gordon Niswender	$50,986	09/15/84	03/31/88	4 Doctoral
Colorado State Univ. Ft. Collins, CO 80523	Gordon Niswender	$27,268	09/15/84	03/31/88	4 Doctoral
Univ. of Chicago Chicago, IL 60637	L. J. Mets	$30,035	09/15/84	03/31/88	5 Doctoral
Univ. of Chicago Chicago, IL 60637	L. J. Mets	$61,086	09/15/84	03/31/88	5 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Univ. of Illinois Urbana, IL 61801	J. A. Shadduck	$57,606	09/15/84	03/31/88	6 Doctoral
Univ. of Illinois Urbana, IL 61801	J. A. Shadduck	$40,902	09/15/84	03/31/88	6 Doctoral
Purdue Res. Fdn. West Lafayette, IN 47907	Bill R. Baumgardt	$39,456	09/15/84	03/31/88	6 Doctoral
Purdue Res. Fdn. West Lafayette, IN 47907	Bill R. Baumgardt	$59,052	09/15/84	03/31/88	6 Doctoral
Univ. of Iowa Iowa City, IA 52242	John E. Butler	$40,902	09/15/84	03/31/88	6 Doctoral
Univ. of Iowa Iowa City, IA 52242	John E. Butler	$62,449	09/15/84	03/31/88	6 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Massachusetts Institute of Technology Cambridge, MA 02139	M. Karel	$54,880	09/15/84	03/31/88	5 Doctoral
Massachusetts Institute of Technology Cambridge, MA 02139	M. Karel	$27,210	09/15/84	03/31/88	5 Doctoral
Michigan State Univ. East Lansing, MI 48824	K. D. Nadler	$34,221	09/15/84	03/31/88	5 Doctoral
Michigan State Univ. East Lansing, MI 48824	K. D. Nadler	$52,654	09/15/84	03/31/88	5 Doctoral
Univ. of Minnesota St. Paul, MN 55108	Burle Gengenbach	$38,404	09/15/84	03/31/88	4 Doctoral
Univ. of Minnesota St. Paul, MN 55108	Burle Gengenbach	$27,268	09/15/84	03/31/88	4 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Univ. of Missouri Columbia, MO 65211	J. N. Berg	$19,158	09/15/84	03/31/88	3 Doctoral
Univ. of Missouri Columbia, MO 65211	J. N. Berg	$30,096	09/15/84	03/31/88	3 Doctoral
Univ. of Missouri Columbia, MO 65211	Douglas D. Randall	$54,536	09/15/84	03/31/88	8 Doctoral
Univ. of Missouri Columbia, MO 65211	Douglas D. Randall	$80,565	09/15/84	03/31/88	8 Doctoral
Cornell Univ. Ithaca, NY 14853	Robert Turgeon	$40,902	09/15/84	03/31/88	6 Doctoral
Cornell Univ. Ithaca, NY 14853	Robert Turgeon	$57,606	09/15/84	03/31/88	6 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: BIOTECHNOLOGY

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Texas A&M Univ. College Station, TX 77843	Thomas O. Baldwin	$47,719	09/15/84	03/31/88	7 Doctoral
Texas A&M Univ. College Station, TX 77843	Thomas O. Baldwin	$67,207	09/15/84	03/31/88	7 Doctoral

TOTAL $1,487,029

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Auburn Univ. Auburn University, AL 36849	Gregory Sullivan	$19,202	09/15/84	03/31/88	2 Doctoral
Auburn Univ. Auburn University, AL 36849	William E. Hardy	$13,634	09/15/84	03/31/88	2 Doctoral
Univ. of California Berkeley, CA 94720	S. Robinson	$27,268	09/15/84	03/31/88	4 Doctoral
Univ. of California Berkeley, CA 94720	S. Robinson	$38,404	09/15/84	03/31/88	4 Doctoral
Univ. of California Berkeley, CA 94720	Dennis Teeguarden	$28,803	09/15/84	03/31/88	3 Doctoral
Univ. of California Berkeley, CA 94720	Dennis Teeguarden	$20,451	09/15/84	03/31/88	3 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Univ. of California Davis, CA 95616	Warren E. Johnston	$38,418	09/15/84	03/31/88	4 Doctoral
Univ. of California Davis, CA 95616	Warren E. Johnston	$27,254	09/15/84	03/31/88	4 Doctoral
Univ. of Florida Gainesville, FL 32611	J. S. Shonkwiler	$76,808	09/15/84	03/31/88	8 Doctoral*
Univ. of Florida Gainesville, FL 32611	J. S. Shonkwiler	$54,536	09/15/84	03/31/88	8 Doctoral*
Univ. of Illinois Urbana, IL 61801	Wiliam L. George	$57,606	09/15/84	03/31/88	6 Doctoral**
Univ. of Illinois Urbana, IL 61801	William L. George	$40,902	09/15/84	03/31/88	6 Doctoral**

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Univ. of Maryland College Park, MD 20742	Rachel Dardis	$43,206	09/15/84	03/31/88	4 Doctoral
Univ. of Maryland College Park, MD 20742	Rachel Dardis	$27,268	09/15/84	03/31/88	4 Doctoral
Michigan State Univ. East Lansing, MI 48824	H. M. Riley	$31,028	09/15/84	03/31/88	3 Doctoral
Michigan State Univ. East Lansing, MI 48824	H. M. Riley	$18,226	09/15/84	03/31/88	3 Doctoral
Univ. of Minnesota St. Paul, MN 55108	Jerome W. Hammond	$52,170	09/15/84	03/31/88	5 Doctoral
Univ. of Minnesota St. Paul, MN 55108	Jerome W. Hammond	$29,920	09/15/84	03/31/88	5 Doctoral

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GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
North Carolina State Univ. Raleigh, NC 27695	R. K. Perrin	$48,005	09/15/84	03/31/88	5 Doctoral
North Carolina State Univ. Raleigh, NC 27695	R. K. Perrin	$34,085	09/15/84	03/31/88	5 Doctoral
Ohio State Univ. Research Foundation Columbus, OH 43212	J. Havlicek, Jr.	$57,606	09/15/84	03/31/88	6 Doctoral
Ohio State Univ. Research Foundation Columbus, OH 43212	J. Havlicek, Jr.	$40,902	09/15/84	03/31/88	6 Doctoral
Oklahoma State Univ. Stillwater, OK 74078	Daniel S. Tilley	$48,005	09/15/84	03/31/88	5 Doctoral
Oklahoma State Univ. Stillwater, OK 74078	Daniel S. Tilley	$34,085	09/15/84	03/31/88	5 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Univ. of Rhode Island Kingston, RI 02881	Thomas F. Weaver	$20,451	09/15/84	03/31/88	3 Doctoral
Univ. of Rhode Island Kingston, RI 02881	Thomas F. Weaver	$28,803	09/15/84	03/31/88	3 Doctoral
Texas Tech Univ. Lubbock, TX 79409	R. C. Albin	$38,404	09/15/84	03/31/88	4 Doctoral
Texas Tech Univ. Lubbock, TX 79409	R. C. Albin	$27,268	09/15/84	03/31/88	4 Doctoral
Washington State Univ. Pullman, WA 99164	LeRoy Rogers	$38,404	09/15/84	03/31/88	4 Doctoral
Washington State Univ. Pullman, WA 99164	LeRoy Rogers	$27,268	09/15/84	03/31/88	4 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD & AGRICULTURAL MARKETING

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Univ. of Wisconsin Madison, WI 53706	Daniel W. Bromely	$40,902	09/15/84	03/31/88	6 Doctoral
Univ. of Wisconsin Madison, WI 53706	Daniel W. Bromley	$57,606	09/15/84	03/31/88	6 Doctoral

TOTAL $1,186,898

* This includes 4 Doctoral's in the Food Science/Human Nutrition National Needs Area.
** This includes 2 Doctoral's in the Agricultural Engineering National Needs Area.

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Alabama A&M Univ. Normal, AL 35762	G. R. Sunki	$20,064	09/15/84	03/31/88	4 Master's
Alabama A&M Univ. Normal, AL 35762	G. R. Sunki	$29,201	09/15/84	03/31/88	4 Master's
Tuskegee Univ. Tuskegee Univ., AL 36088	Eloise Carter	$25,257	09/15/84	03/31/88	3 Master's
Tuskegee Univ. Tuskegee Univ., AL 36088	Eloise Carter	$12,048	09/15/84	03/31/88	3 Master's
Univ. of Arizona Tucson, AZ 85721	D. E. Goll	$6,574	09/15/84	03/31/88	1 Master's
Univ. of Arizona Tucson, AZ 85721	D. E. Goll	$5,016	09/15/84	03/31/88	1 Master's

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GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Univ. of California Davis, CA 95616	R. B. Rucker	$54,536	09/15/84	03/31/88	8 Doctoral
Univ. of California Davis, CA 95616	R. B. Rucker	$78,582	09/15/84	03/31/88	8 Doctoral
Univ. of Southern California Los Angeles, CA 90089	S. P. Bessman	$27,268	09/15/84	03/31/88	4 Doctoral
Univ. of Southern California Los Angeles, CA 90089	S. P. Bessman	$78,234	09/15/84	03/31/88	4 Doctoral
Univ. of Connecticut Storrs, CT 06268	K. L. Knox	$34,085	09/15/84	03/31/88	5 Doctoral
Univ. of Connecticut Storrs, CT 06268	K. L. Knox	$48,005	09/15/84	03/31/88	5 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Univ. of Georgia Athens, GA 30602	Carolyn Berdanier	$27,268	09/15/84	03/31/88	4 Doctoral
Univ. of Georgia Athens, GA 30602	Carolyn Berdanier	$42,399	09/15/84	03/31/88	4 Doctoral
Kansas State Univ. Manhattan, KS 66506	D. Y. C. Fung	$58,804	09/15/84	03/31/88	6 Doctoral
Kansas State Univ. Manhattan, KS 66506	D. Y. C. Fung	$40,902	09/15/84	03/31/88	6 Doctoral
Univ. of Massachusetts Amherst, MA 01003	R. G. Brown	$48,005	09/15/84	03/31/88	5 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Univ. of Massachusetts Amherst, MA 01003	R. G. Brown	$34,085	09/15/84	03/31/88	5 Doctoral
Tufts Univ. Boston, MA 02111	Stanley Gershoff	$40,902	09/15/84	03/31/88	6 Doctoral
Tufts Univ. Boston, MA 02111	Stanley Gershoff	$57,978	09/15/84	03/31/88	6 Doctoral
Michigan State Univ. East Lansing, MI 48824	T. R. Dutson	$13,634	09/15/84	03/31/88	2 Doctoral
Michigan State Univ. East Lansing, MI 48824	T. R. Dutson	$19,202	09/15/84	03/31/88	2 Doctoral
Univ. of Minnesota St. Paul, MN 55108	Elwood Caldwell	$19,575	09/15/84	03/31/88	3 Master's

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Univ. of Minnesota St. Paul, MN 55108	Elwood Caldwell	$14,679	09/15/84	03/31/88	3 Master's
Mississippi State Univ. Mississippi State, MS 39762	Gale R. Ammerman	$22,405	09/15/84	03/31/88	2 Master's, 1 Doctoral
Mississippi State Univ. Mississippi State, MS 39762	Gale R. Ammerman	$16,849	09/15/84	03/31/88	2 Master's, 1 Doctoral
Univ. of Nebraska Lincoln, NE 68583	Chris R. Calkins	$6,402	09/15/84	03/31/88	1 Master's
Univ. of Nebraska Lincoln, NE 68583	Chris R. Calkins	$5,016	09/15/84	03/31/88	1 Master's
Cornell Univ. Ithaca, NY 14853	M. C. Nesheim	$39,402	09/15/84	03/31/88	6 Doctoral

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Cornell Univ. Ithaca, NY 14853	M. C. Nesheim	$59,106	09/15/84	03/31/88	6 Doctoral
Pennsylvania State Univ. University Park, PA 16802	Arun Kilara	$30,096	09/15/84	03/31/88	6 Master's*
Pennsylvania State Univ. University Park, PA 16802	Arun Kilara	$38,412	09/15/84	03/31/88	6 Master's*
Univ. of Tennessee Knoxville, TN 37901	Hugh O. Jaynes	$10,032	09/15/84	03/31/88	2 Master's
Univ. of Tennessee Knoxville, TN 37901	J. T. Miles	$12,804	09/15/84	03/31/88	2 Master's
Utah State Univ. Logan, UT 84322	Jeffery K. Kondo	$5,016	09/15/84	03/31/88	1 Master's

GRADUATE FELLOWSHIP PROGRAM
PROGRAM AREA: FOOD SCIENCE/HUMAN NUTRITION

GRANTS AWARDED FOR FISCAL YEAR 1985

ORGANIZATION	PRINCIPAL INVESTIGATOR	AMOUNT	AGREEMENT PERIOD FROM	TO	FELLOWSHIPS SUPPORTED
Utah State Univ. Logan, UT 84322	Jeffery K. Kondo	$6,402	09/15/84	03/31/88	1 Master's

TOTAL $1,088,245

* This includes 3 Master's in the Agricultural Engineering National Needs Area.

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SCIENTISTS WHO SERVED ON USDA/S&E PEER REVIEW PANELS FOR FISCAL YEAR 1985

Scientists from government, universities, and industry served on USDA/S&E peer review panels this past year. Each panel was put together to fit the expertises needed for that specific granting area. The scientists involved are listed below alphabetically within their respective States.

ALABAMA

Cindy Brunner
Auburn University

James D. Harper
Auburn University

John A. Plumb
Auburn University

Ronald Young
University of Alabama

ALASKA

John A. Yarie
University of Alaska

ARIZONA

Ronald E. Allen
University of Arizona

Edwin H. Carpenter
University of Arizona

ARIZONA—continued

David K. Y. Lei
University of Arizona

Michael A. McClure
University of Arizona

John W. Radin
ARS-USDA

J. Glenn Songer
University of Arizona

ARKANSAS

Harry K. Dupree
U.S. Dept. of. the Interior

Timothy T. Ku
University of Arkansas, Monticello

Frederick M. Stephen
University of Arkansas

CALIFORNIA

Gary Anderson
University of California-Davis

Thomas C. Baker
University of California-Riverside

Michael L. Bruss
University of California-Davis

John M. Duniway
University of California-Davis

Mary K. Firestone
University of California-Berkeley

Graham A. E. Gall
University of California-Davis

John P. Hughes
University of California-Davis

CALIFORNIA—continued

Laurel J. Gershwin
University of California-Davis

Arthur R. Grossman
Carnegie Institution of Washington

Stephen H. Howell
University of California-San Diego

W. M. Jarrell
University of California-Riverside

Russell L. Jones
University of California-Berkeley

Christopher Lamb
The Salk Inst. for Biol. Studies

Bo Lonnerdal
University of California-Davis

Joseph G. Morse
University of California-Riverside

J. Brian Mudd
ARCO Plant Cell Research Inst.

Melvin Y. Okamura
University of California-San Diego

Ronald R. Sederoff
Forest Service-USDA

CALIFORNIA-continued

Wendy K. Silk
University of California-Davis

William C. Taylor
University of California-Berkeley

William F. Thompson
Carnegie Institute of Washington

William E. Timberlake
University of California-Davis

Judith R. Turnlund
ARS-USDA

Loy Elaine Volkman
University of California-Berkeley

Charles West
University of California-Los Angeles

David L. Wood
University of California-Berkeley

COLORADO

Rupert P. Amann
Colorado State University

J. C. DeMartini
Colorado State University

Karel Grohmann
Solar Energy Res. Institute

COLORADO—continued

William R. Jacobi
Colorado State University

Terry M. Nett
Colorado State University

Leonard D. Pearson
Colorado State University

George Seidel
Colorado State University

Stephen J. Wallner
Colorado State University

Frederick F. Wangarrd
Consultant

CONNECTICUT

Louis van der Heide
University of Connecticut

Dennis Knudson
Yale University

Michael E. Montgomery
Forest Service-USDA

DELAWARE

George H. Lorimer
E. I. Dupont De Nemours & Co.

DELAWARE—continued

Thomas K. Wood
University of Delaware

DISTRICT OF COLUMBIA

Marie M. Cassidy
George Washington University

Lawrence W. Hill
Forest Service-USDA

Richard A. Neal
Agency of International
Development

Howard Rosen
Forest Service-USDA

Neil A. Storms
Office of Rural Development
Policy, USDA

Steve Zobrisky
CSRS-USDA

FLORIDA

Fuller W. Bazer
University of Florida

Lionel J. Beaulieu
University of Florida-IFAS

FLORIDA-continued

Peggy R. Borum
University of Florida

George E. Bowes
University of Florida

Francis F. Busta
University of Florida

Michael J. P. Lawman
University of Florida

J. T. Neilson
University of Florida

Herbert Oberlander
ARS-USDA

Daryl R. Pring
ARS-USDA

Robert A. Schmidt
University of Florida

Daniel L. Shankland
University of Florida

GEORGIA

R. Harold Brown
University of Georgia

Glenn A. Galau
University of Georgia

GEORGIA-continued

Robert W. Matthews
University of Georgia

Louis W. Schierman
University of Georgia

IDAHO

Alan L. Lambuth
Boise Cascade Technical Ctr.

ILLINOIS

Cleora J. D'Arcy
University of Illinois

Marvin O. Bagby
ARS-USDA

Wayne L. Banwart
University of Illinois

Robert W. Detroy
Signal-UOP Res. Ctr.

Phillip Dziuk
University of Illinois

Michael Irwin
University of Illinois

John B. Ohlrogge
ARS-USDA

Illinois—continued

Robert M. Skirvin
University of Illinois

Edward W. Voss
Northwestern Univ.

Judith Willis
University of Illinois

INDIANA

Arthur Aronson
Purdue University

Ray A. Bressan
Purdue University

Richard A. Dilley
Purdue University

Stanton B. Gelvin
Purdue University

Paul A. Hammer
Purdue University

Andrew O. Jackson
Purdue University

Michael R. Ladisch
Purdue University

INDIANA—continued

Stephen B. Lovejoy
Purdue University

P. V. Malven
Purdue University

Lee E. Sommers
Purdue University

IOWA

Lawrence H. Arp
Iowa State University

Billy L. Deyoe
ARS-USDA

Glynn H. Frank
ARS-USDA

Floyd G. Manwiller
Iowa State University

Reid G. Palmer
Iowa State University

Cecil R. Stewart
Iowa State University

Luisa Tabatabai
ARS-USDA

KANSAS

Richard D. Black
Kansas State University

Arun K. Chatterjee
Kansas State University

Embert H. Coles
Kansas State University

Karl Joseph Kramer
ARS-USDA

Sean Lynch
Kansas State Univ. Medical Ctr.

Rollins G. Sears
Kansas State University

KENTUCKY

Daniel A. Potter
University of Kentucky

LOUISIANA

Sue Bartlett
Louisiana State University

Thomas R. Klei
Louisiana State University

Robert Romaire
Louisiana State University

LOUISIANA—continued

J. Storz
Louisiana State University

MAINE

Michael-Sargent Greenwood
University of Maine

Christa R. Schwintzer
University of Maine

MARYLAND

Joel Bitman
ARS-USDA

Douglas Bolt
ARS-USDA

R. A. Bram
ARS-USDA

Ronald Fayer
ARS-USDA

Albert J. Guidry
ARS-USDA

Robert J. Maier
Johns Hopkins University

MARYLAND—continued

Warren W. Marquardt
University of Maryland

Caird E. Rexroad
ARS-USDA

Jerry Ritchie
ARS-USDA

Heven Sze
University of Maryland

Lila Vodkin
ARS-USDA

MASSACHUSETTS

Frederick M. Ausubel
Massachusetts General Hospital

Robert E. Blankenship
Amherst College

Helga Boedtker
Harvard University

Ring R. T. Carde
University of Massachusetts

Mary K. Mandels
U.S. Army

MASSACHUSETTS—continued

Allan A. Marra
University of Massachusetts

Mark Mount
University of Massachusetts

Priscilla A. Schaffer
Harvard Medical School

Peter L. Pellett
University of Massachusetts

John Gordon Torrey
Harvard University

Roy G. VanDriesche
University of Massachusetts

Daniel I. C. Wang
Massachusetts Institute
of Technology

MICHIGAN

Douglas Foster
University of Michigan

MICHIGAN—continued

Pamela J. Fraker
Michigan State University

James W. Hanover
Michigan State University

James R. Miller
Michigan State University

MINNESOTA

Martin E. Bergeland
University of Minnesota

Mark L. Brennen
University of Minnesota

John G. Haygreen
University of Minnesota

John A. Newman
University of Minnesota

Carolyn D. Silflow
University of Minnesota

Patricia B. Swan
University of Minnesota

MISSISSIPPI

John Deavers Hodges
Mississippi State University

MISSOURI

Harold Eugene Garrett
University of Missouri

Gray S. Henderson
University of Missouri

Tuan-hua David Ho
Washington University

Donald Miles
University of Missouri

Joseph C. Polacco
University of Missouri

Stephen G. Pueppke
University of Missouri

Stephen G. Rogers
Monsanto Company

Karel R. Schubert
Washington University

Louis A. Sherman
University of Missouri

MONTANA

Roland L. Barger
Forest Service-USDA

NEBRASKA

J. M. Daly
University of Nebraska

David W. Galbraith
University of Nebraksa

James R. Gilley
University of Nebraksa

John C. Osterman
University of Nebraska

Thomas Hugh Wise
ARS-USDA

NEW HAMSPHIRE

Thomas C. Harrington
University of New Hamsphire

NEW JERSEY

Randy Gaugler
Rutgers, The State University

Richard A. Kramer
Hoffman-La Roche

Colin G. Scanes
Rutgers, The State University

NEW MEXICO

Steven D. Tanksley
New Mexico State University

NEW YORK

Philip Ammirato
Columbia University

Ronald E. Brooks
General Electric R&D Ctr.

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Rensselaer Polytechnic Institute

Leland E. Carmichael
Cornell University

Wilfred A. Cote
SUNY-Syracuse

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Cold Spring Harbor Laboratory

Ronald J. Dinus
International Paper Company

Elizabeth D. Earle
Cornell University

Lance S. Evans
Manhattan College

Timothy J. Fahey
Cornell University

NEW YORK--continued

Robert H. Foote
Cornell University

Marvin Grubman
ARS-USDA

Patrick R. Hughes
Cornell University

Robert W. Langhans
Cornell University

Carl N. McDaniel
Rensselaer Polytechnic Institute

Paula McKeown-Longo
SUNY-Albany

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International Paper Company

John Christopher Sanford
Cornell University

Robert C. Seem
NYS Agric. Expt. Station

NORTH CAROLINA

Harry Dan Amerson
North Carolina State University

Leroy Coggins
North Carolina State University

NORTH CAROLINA

William G. Dougherty
North Carolina State University

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North Carolina State University

Russell Lea
North Carolina State University

C. Sam Levings, III
North Carolina State University

Ralph L. Mott
North Carolina State University

David Schomberg
Duke University

Ruth M. Shuman
North Carolina State University

James N. Siedow
Duke University

NORTH DAKOTA

Malcolm H. Smith
North Dakota State University

OHIO

Wolfgang Dietz Bauer
Battelle/C.F. Kettering
Research Lab.

David L. Denlinger
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Leon S. Dochinger
Forest Service-USDA

L. E. Heider
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Nelson B. King
Veterinarian Consultant, Wooster

Erwin W. Kohler
Ohio State University-OARDC

George Marzluf
Ohio State University

L. J. Saif
Ohio State University-OARDC

John G. Streeter
Ohio State University-OARDC

OHIO—continued

Frank William Whitmore
Ohio State University-OARDC

Richard F. Wilson
Ohio State University

OKLAHOMA

Roger J. Panciera
Oklahoma State University

OREGON

Wesley Thomas Adams
Oregon State University

Nancy J. Alexander
Oregon Regional Primate Res.
Center

Michael J. Burke
Oregon State University

William L. Galligan
Lumber Company, Inc.

James Lannan
Oregon State University

Steven R. Radosevich
Oregon State University

OREGON—continued

Alvin R. Smith
Oregon State University

Ralph S. Quatrano
Oregon State University

PENNSYLVANIA

Andrew N. Binns
University of Pennsylvania

Stephen B. Horsley
Forest Service-USDA

A. Catherine Ross
Medical College of Pennsylvania

Herbert S. Siegel
Pennsylvania State University

Stanley E. Stevens, Jr.
Pennslyvania State University

SOUTH CAROLINA

Roger H. Sawyer
University of South Carolina

TENNESSEE

Karen W. Hughes
University of Tennessee

TENNESSEE—continued

J. William Johnston, Jr.
Oak Ridge National Laboratory

Kelly R. Robbins
University of Tennessee

Gary Stacey
University of Tennessee

Jeffery D. Wolt
University of Tennessee

TEXAS

L. Garry Adams
Texas A&M University

John S. Boyer
Texas A&M University

Raymond F. Burk
University of Texas

Claude Desjardins
University of Texas

Patrick J. Hegarty
University of Houston

David B. Knaff
Texas Tech University

R. W. Loan
Texas A&M University

TEXAS—continued

Edmund W. Lusas
Texas A&M University

Marshall E. Mace
ARS-USDA

John Mullet
Texas A&M University

Thomas L. Payne
Texas A&M University

Charles W. Purdy
ARS-USDA

Mary Ann Rankin
University of Texas

Roberta H. Smith
Texas A&M University

Edward J. Soltes
Texas A&M University

William H. Stone
Trinity University

Darrell N. Ward
M.D. Anderson Hospital
and Tumor Institute

Robert M. Whiting, Jr.
Steven F. Austin State University

TEXAS—continued

Randall D. Wood
Texas A&M University

Johannes P. vanBuijtenen
Texas A&M University

UTAH

Roger E. Wyse
Utah State University

VIRGINIA

Bruce A. Averill
University of Virginia

Jiann-Shin Chen
Virginia Polytechnic Institute
and State University

Boris I. Chevone
Virginia Polytechnic Institute
and State University

Craig Hammerberg
Virginia Polytechnic Institute
and State University

Irwin Konigsberg
University of Virginia

VIRGINIA—continued

George H. Lacy
Virginia Polytechnic Institute
and State University

C. E. Polan
Virginia Polytechnic Institute
and State University

Franklin E. Woeste
Virginia Polytechnic Institute
and State University

WASHINGTON

L. B. Corbeil
Washington State University

Francis C. Beall
Weyerhaeuser Company-Tacoma

William C. Davis
Washington State University

Norman L. Gates
Washington State University

Thomas Metcalf Hinckley
University of Washington

Michael L. Kahn
Washington State University

Alex G. Ogg, Jr.
ARS-USDA

Kyosti V. Sarkanen
University of Washington

WASHINGTON-continued

Mike Thomashow
Washington State University

John N. Thompson
Washington State University

Roger Timmis
Weyerhaeuser Tech. Ctr.

James W. Truman
University of Washington

Alan Upshall
Zymogenetics, Inc.

Tilahun Yilma
Washington State University

WEST VIRGINIA

Graham L. Bullock
U.S. Dept. of the Interior

WISCONSIN

Ken Barton
Agracetus

David T. Berman
University of Wisconsin

Don Dierschke
University of Wisconsin

Phillip M. Farrell
University of Wisconsin

Neal First
University of Wisconsin

WISCONSIN-continued

Ronald L. Giese
University of Wisconsin

Jack Gorski
University of Wisconsin

Kenneth G. Keegstra
University of Wisconsin

Sue Loesch-Fries
Agrigenetic Corp.

Werner F. W. Lonsky
Institute of Paper Chemistry

Ronald D. Schultz
University of Wisconsin

Jon Mark Scriber
University of Wisconsin

Lawrence A. Soltis
Forest Service-USDA

Gary A. Splitter
University of Wisconsin

Roger Tuomi
Forest Service-USDA

Raymond A. Young
University of Wisconsin